ENGINEERING NEWS-RECORD

Paper mills don't always mean pollution p.34

A McGRAW-HILL PUBLICATION

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PDM STEEL COMPANY

PIONEER IN SPACE SIMULATION

a primary source for COMPLETE ENVIRONMENTAL FACILITIES

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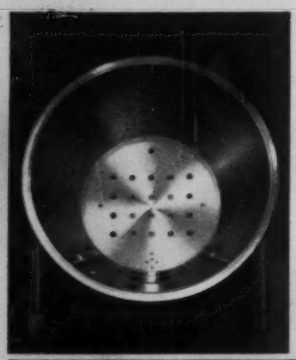
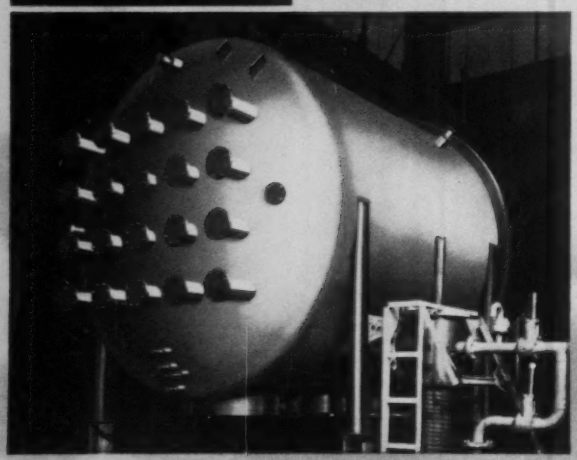
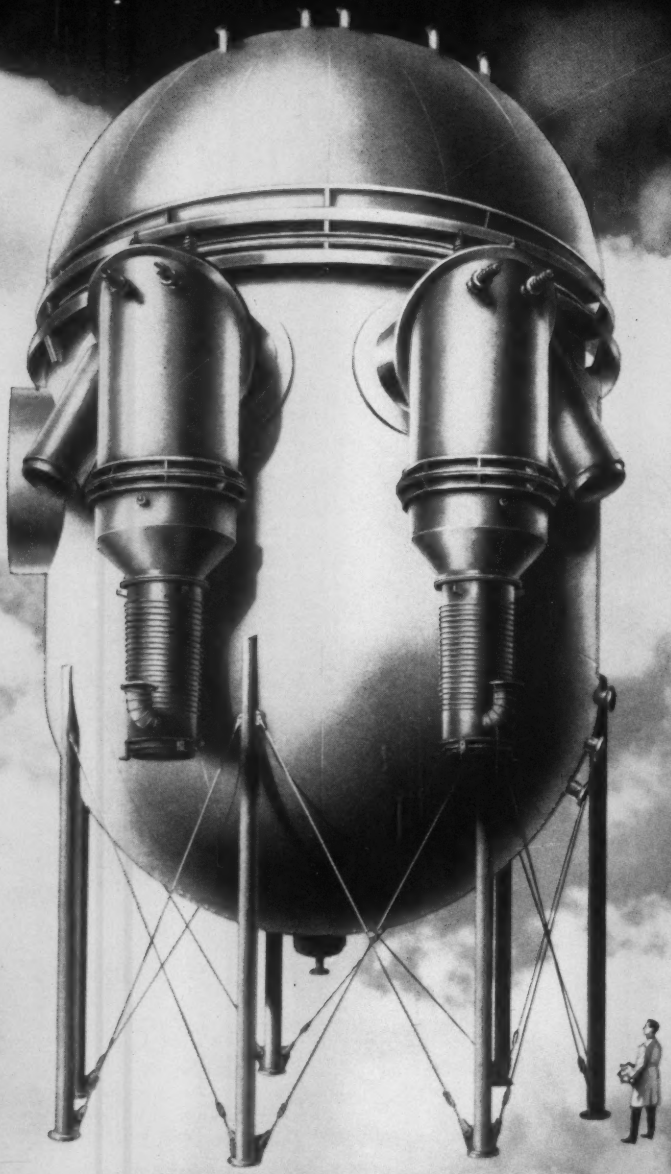


FOR CHANCE VOUGHT DALLAS

(Tenney Engineering, Inc.)

This polished chamber of stainless steel for Chance Vought's orbital simulation is 12 ft dia x 16 ft long. In service, pressure will be reduced to 1×10^{-7}mm Hg, or 1,100,000 ft. Lower photo shows mass spectrometer testing.





FOR GENERAL ELECTRIC VALLEY FORGE

The largest high vacuum chamber constructed to date —32 ft dia x 54 ft high. Designed for ultimate 10^{-9} service, this chamber has a polished stainless steel interior. Pump ports are equipped with PDM-designed liquid nitrogen cooled elbows. The vessel contract includes a pumping system designed and furnished by Consolidated Vacuum Corporation.

WRITE, PHONE, WIRE

PITTSBURGH-DES MOINES STEEL COMPANY

GENERAL OFFICES: Neville Island, Pittsburgh 25, Pennsylvania • FEderal 1-3000 • District Offices in Principal Cities

PLANTS AT: Pittsburgh, Warren, Bristol, Pa. • Baltimore • Birmingham • Des Moines • Provo, Utah • Casper, Wyo. • Santa Clara, Fresno, Stockton, Calif.

NOW! Goodyear off-the-road tires give you the protection of steel to minimize cuts and cut growth!

Here's important news! The Super Road Lug and other Goodyear construction equipment tires now give you *shredded wire undertreads!* That means, with the Super Road Lug, for instance, you get:

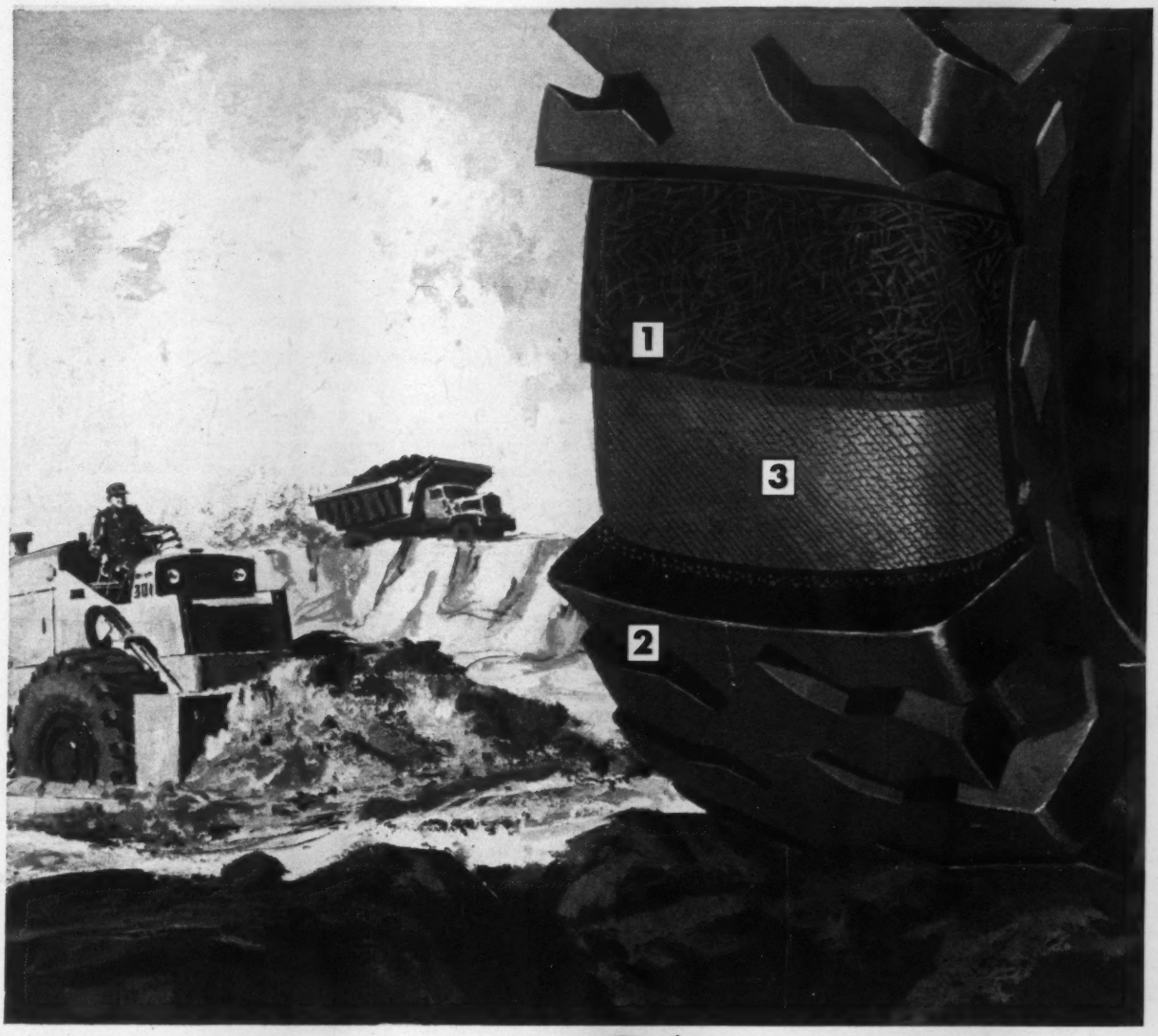
1 **A rugged shredded wire barrier** that fights body-penetrating cuts, reduces separation, retards cut growth and serves as a cushioning bridge between the carcass and the tread. This gives you a tougher, longer-lasting construction that pays off in more service!

2 **An extra-thick tread** with up to 50% more nonskid tread than ordinary tires! This gives you more miles for your dollar, more heft and traction on tough jobs!

3 **Exclusive 3-T processed Nylon Cord,** triple-tempered by Tension, Temperature and Time to make bruise-breaks and blowouts all but a thing of the past!

All these dramatic features add up to increased tire life and more miles for your tire dollar. Prove them for yourself. See your Goodyear dealer—today!

Goodyear, Truck Tire Dept., Akron 16, Ohio



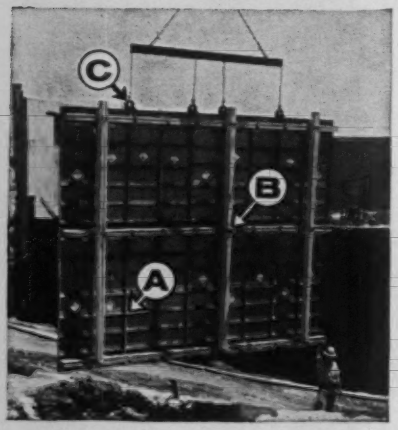
Buy and Specify GOODYEAR

More tons are hauled on Goodyear Truck Tires than on any other kind

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

New Products

speed-up gang forming



New gang form bolt

Eliminates the necessity of stripping and resetting panels individually. Panels can be added or removed at any time. After gang section is set in place, ties are inserted. When stripping, ties can be broken back before removing section.

New gang form waler set

Attaching walers to gang sections is faster and easier. Simply insert waler rod between double waler, slip bracket over waler rod, and fasten securely with a wing nut. 6" and 8" rods are used with 2 x 4 and 2 x 6 walers...13½" rods available for 2 x 4 or 2 x 6 walers with 2 x 6 strongbacks.

New gang form lifting bracket

Secure cable hooks to lifting brackets, and gang section is ready for stripping and setting. Safe recommended load per bracket is 2000 lbs. Approximate weight of square foot of section is 6 lbs (including hardware, walers and strongbacks.)

Write for more information about these new products.

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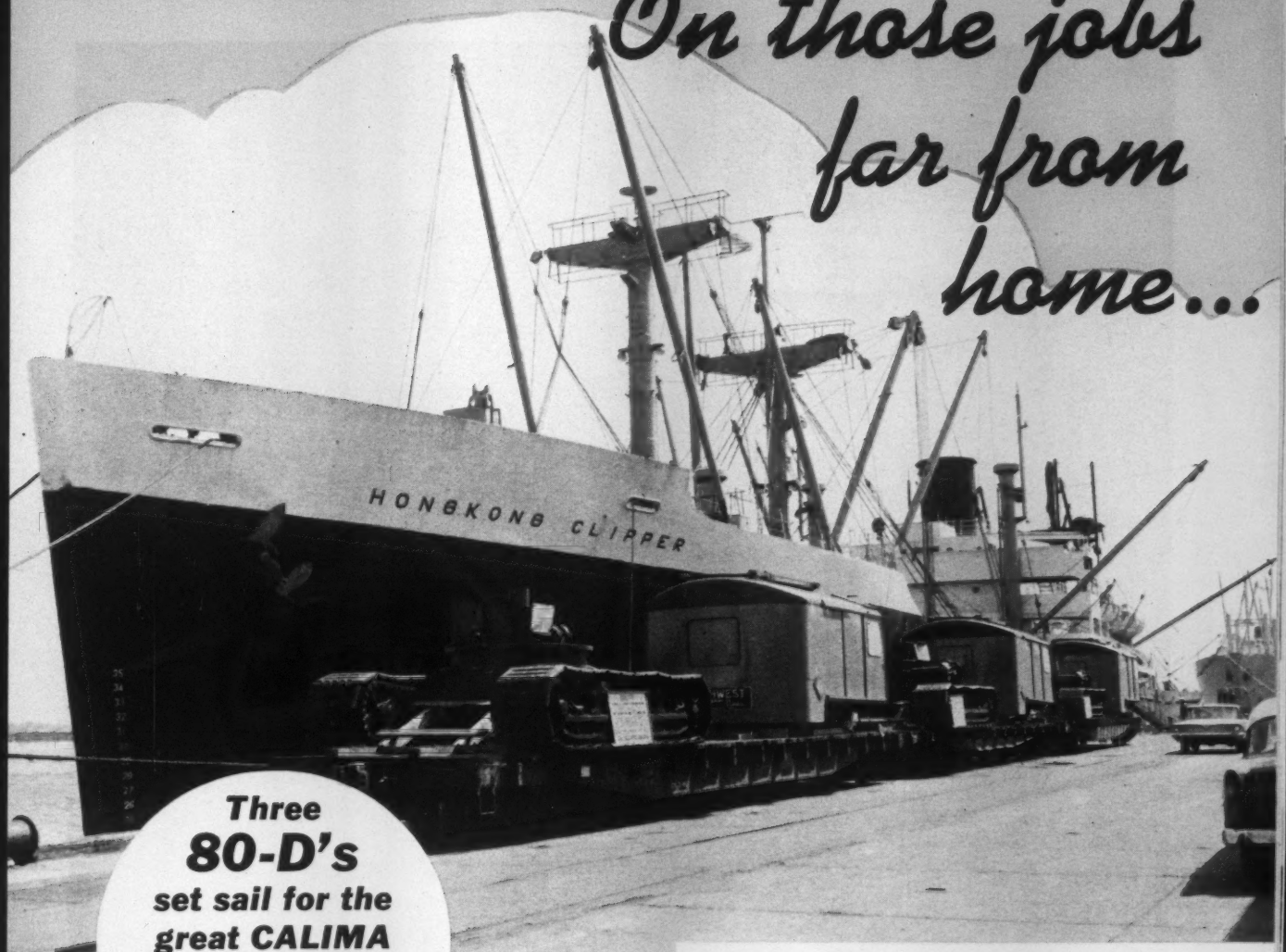
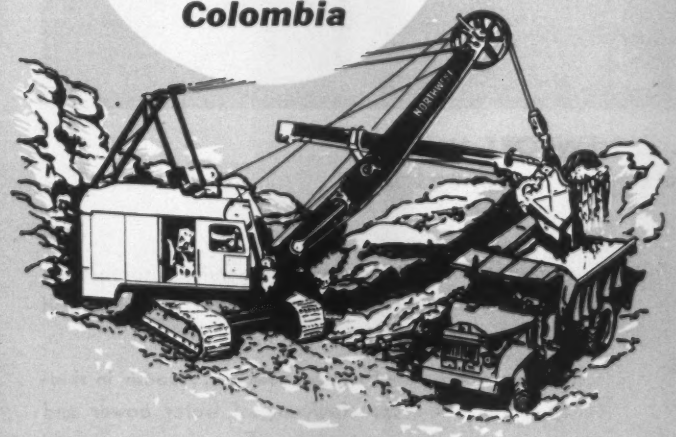
On those jobs far from home...



Three 80-D's set sail for the great CALIMA HYDROELECTRIC project in Colombia



PERINI CORPORATION makes sure with the DEPENDABLE 80-D NORTHWEST

These three Northwest 80-D's alongside the big Hongkong Clipper have a long journey ahead of them. They are bound for Colombia, South America, for the great Calima Hydroelectric job. This will be one of the biggest dams and power plants in Latin America, and the entire cost of the project will run to $50,000,000. We could number these machines 63, 64, and 65, for this shipment of Northwest equipment makes 65 Northwests that the Perini Corporation has bought over the years.

Here again this famous builder has demonstrated that Northwests give him the dependability—the output he needs.

—And it is particularly significant that on a job far from home his choice is the 80-D.

NORTHWEST 3/4 to 4-1/2 Cu. Yd. Capacity

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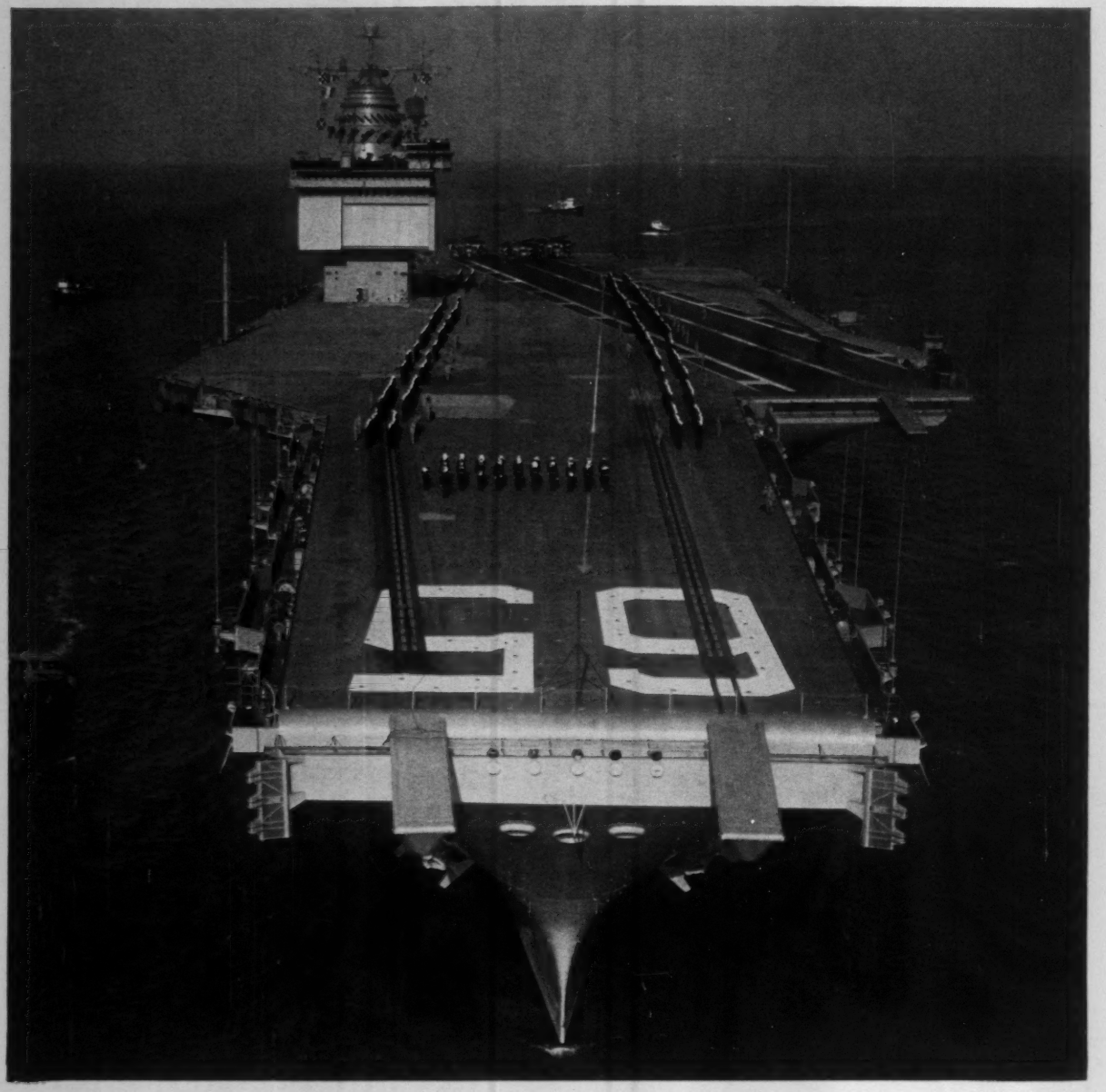

ENTERPRISE . . . at NEWPORT NEWS
a word with a double meaning!

To most people, it means the world's first nuclear-powered aircraft carrier. To us at the Shipyard, it means the energy, imagination and resourcefulness that delivered the great *Enterprise* nine weeks ahead of schedule—in many months less time than was taken to build some non-nuclear ships of her type.

Because of her eight reactors and extensive electronic system, no shipbuilding job was ever more complex. For 1,366 days, many constantly-changing challenges were met and surmounted. How well the men, methods and machines of Newport News discharged their responsibility for building the world's largest ship is now a matter of public and official record.

This is *enterprise at Newport News* . . . leader in shipbuilding and in the manufacturing of water power and other heavy industrial equipment.

Newport News
SHIPBUILDING AND DRY DOCK CO. NEWPORT NEWS, VIRGINIA

You can't legislate against carelessness !

Many businesses and industries discharge their waste products into city sewers. The strictest regulations on what may or may not be dumped into sewers can, and often are, defeated by one willful or ignorant person. You cannot tell what your sewers may be called upon to carry. The only answer is to construct sewers of a pipe that can safely carry virtually every known chemical. There is only one pipe you know will endure: vitrified clay pipe. Amvit Jointed Clay Pipe is strong and rigid, can't sag or bend. The plastic joint, like the pipe, is acid resistant. And, roots cannot enter this tight compression joint. Acid-laden, high temperature sewage will not bother Amvit Jointed Clay Pipe in any way. Neither will the abrasive action of sand or gravel. For more information on how Amvit can help cut sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you. We're the only company that can give you overnight delivery to any point from Missouri to Maine.

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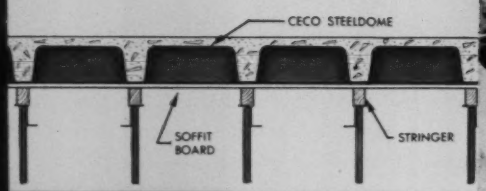
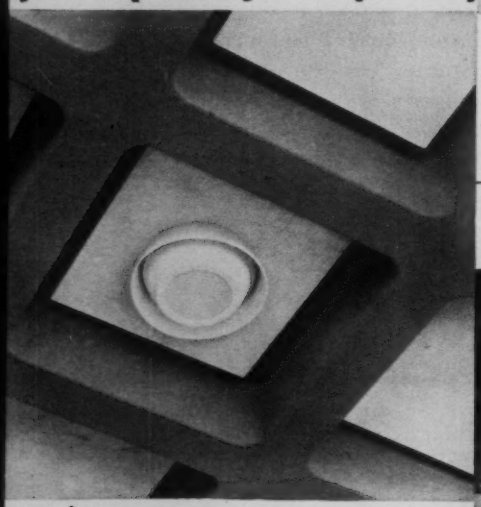
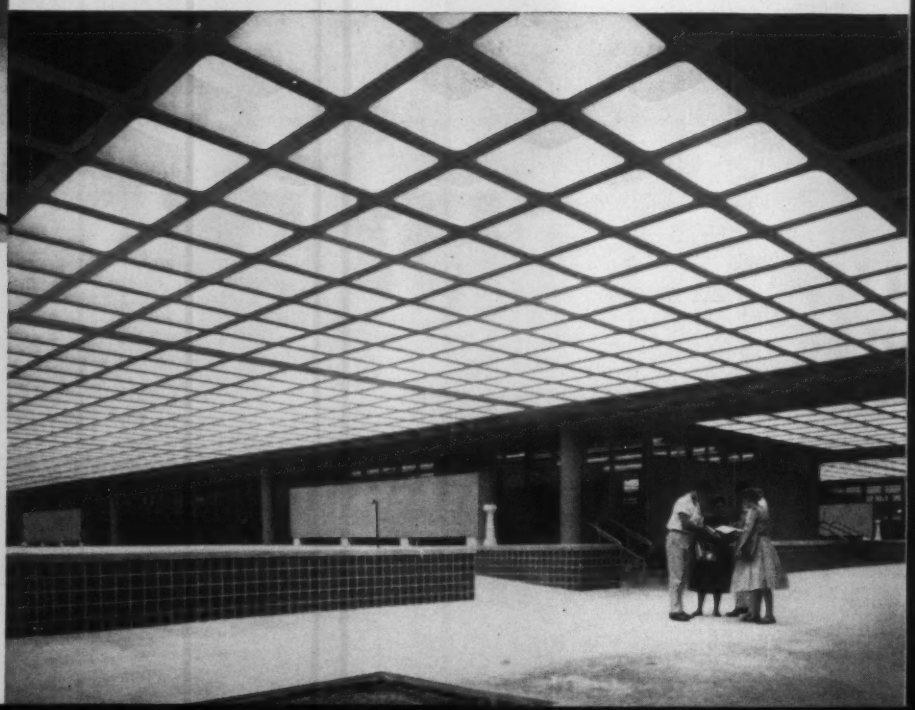
In construction products
Ceco engineering
makes the
big difference



New 20-story Merchandise Mart Building in Atlanta, Georgia, utilizes Ceco Steeldome construction.
Architect: Edwards & Portman
Engineer: Jack Wilborn
Contractor: Consolidated Realty Investments, Inc.



▲ *Typical Steeldome ceiling treatment with acoustical finish on exposed concrete, and acoustical tile in voids.*



Dramatic effect is created with "open-grid" ▶ used for patio area of newly constructed North Central High School, Miami, Florida.
Architect: Polevitzky, Johnson & Associates
Engineer: H. J. Ross and Associates
Contractor: Thompson & Polizzi Construction Company

In Washington, D.C., the Riddell Building was designed with floors and ceilings of Ceco Steeldome construction.

Structure at left end is the Bank of Commerce, an earlier Ceco floor-framing project.

Architect: Corning, Moore, Elmore & Fischer | *Contractor: Standard Construction Co., Inc.*

You can achieve long spans, heavier loads, unusual ceiling decor when your designs call for...

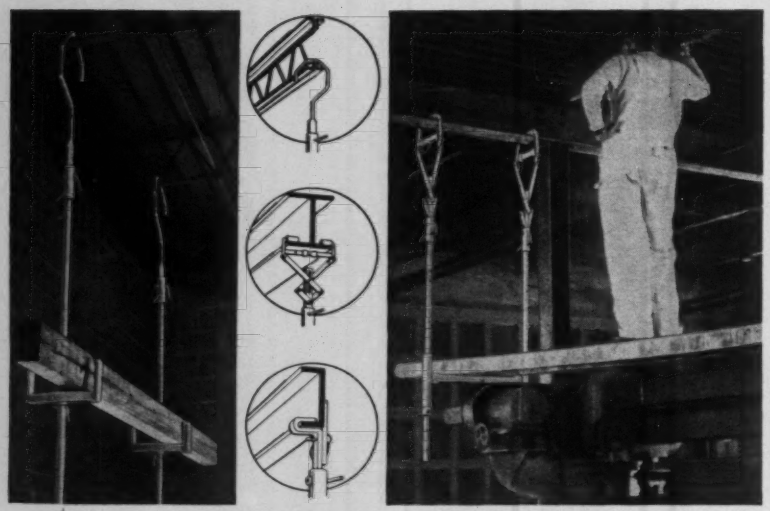
Ceco Steeldome 2-way concrete joist construction

There's a trend to two-way dome slab construction. From coast to coast you see "waffle-type" exposed ceilings—in commercial buildings, banks, apartments, hospitals, schools, churches, parking garages . . . in new buildings of every description. Why? Two reasons: (1) two-way dome slab construction permits economical long spans and heavier loads, and (2) the Ceco Steeldome way of forming this construction offers opportunities for unusual interior styling. You can create special ceiling effects at low cost by painting the smooth concrete surfaces, or spraying on acoustical material. You can apply acoustical tile—or design for "open" treatment. There are many possibilities awaiting your skill.

For additional information about Ceco Steeldome construction, as well as one-way construction with flangeforms, adjustables and longforms, ask for your copy of newly published 72-page manual 4002-C, "Monolithic Reinforced Concrete Construction with Ceco Service."

Ceco Steel Products Corporation | *5601 W. 26th Street, Chicago 50, Illinois*

steelforms • concrete reinforcing • steel joists • curtainwalls, windows, screens, doors • steel buildings • roofing products • metal lath



New Suspended Scaffold Equipment

Adaptable for Mechanical Trades and Maintenance Departments

Simple to erect off the floor over stock piles, machinery, other obstructions. *No tools needed.* Suspend from Bar Joist, Angles, Beams. Stationary or rolling positions, etc. Adjustable for height. Interchangeable. *Safe.* Easy to dismantle. Also models for OUTDOOR use on bridge beams and girders; other applications. Write for literature—*we can help you with ANY scaffolding problem.*

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Swing-Lo SUSPENDED SCAFFOLD CO.
Covert, Michigan

30 years of service to industry

and still growing.... A record based on our ability to provide modern equipment and efficient personnel to perform a wide range of construction services.

Today P.C.&R. is prepared to give greater service than ever before to government and industry. For help on your unusual construction problem call P.C.&R., 6855 E. Rosecrans Ave., Paramount, California, NEvada 6-9213.

Reader Comment

Plants No Panacea

SIR—Your article regarding federal grants aiding the water pollution program (ENR Oct. 5, p. 21) touches on a very controversial subject. If we consider only the construction of sewage works, perhaps we can say, yes, federal aid does help. If we discuss whether construction of works has reduced water pollution, then we can disagree.

In sewage treatment the items of importance are the reduction of BOD and the removal of solids. We speak of the potential health hazard of pollution by sewage, but there is little or no agreement with specific reference to the required quality of the plant effluent needed to protect the receiving stream. Nearly all tend to use the dilution value of the stream as a means of holding treatment costs to a minimum.

We therefore can conclude that the building of a sewage treatment works is not going to reduce the pollution problem due to sewage. Sadly lacking is acceptance of the responsibility to do the best job at hand and to respect the rights of others and, ultimately, produce cleaner waters. Maybe our weakness is in the field of compliance and proper enforcement, and a lack of agreement as to what constitutes a potential health hazard.

Keep plugging away at the problem of pollution. Maybe some day we may see real enforcement and, as a result, cleaner waters.

GEORGE J. HAZEY
Superintendent of Water
Wyandotte, Mich.

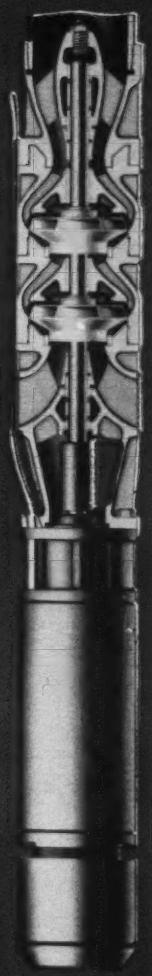
The Little Darlin's

SIR—It is quite obvious that your fine publication is directed to the men in our industry. However, the hundred-odd members of our organization here in Atlanta, want to extend to you our congratulations for providing us, the distaff side, with an interesting and helpful aid to our work. Not only the engineers, architects, estimators and contractors, in our ranks, but the secretaries, as well, find the information in your magazine to be most concise and apprising.

Keep up the good work.

(MISS) JACKIE THOMAS
Women in Construction of Atlanta
Atlanta, Ga.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



Regular Submersible

Layne SINCE 1882

SUBMERSIBLE PUMPS

deliver water

economically

consistently

silently

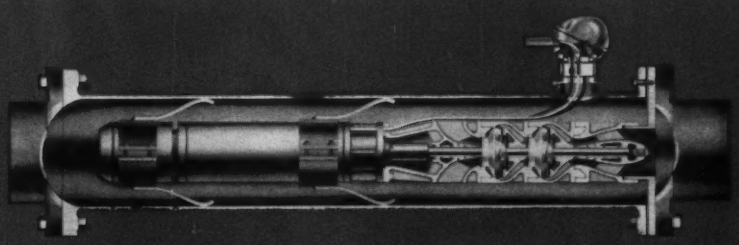
efficiently

The Layne Submersible Pump installation gives you noise free operation because the pump and motor are completely submerged. The Layne Submersible is adaptable to all wells; requires a minimum of space since no pump house is required; eliminates possibility of water contamination; and eliminates the opportunity for vandalism or other accidental mishap or damage.

Layne Submersible Pumps are available for wells as small as 6 inches and in capacities from 30 GPM up. For additional information write for free bulletin number 202.

The Layne In-Line Submersible pump provides the answer to many problems in booster pump applications. The pump operates as an integral part of the line and is designed for use by municipalities, industry, such as petroleum and chemical plants and by agriculture. Advantages include: simple installation, no additional space required, continuous service even under flood conditions, and no possibility of surface water contamination.

Layne In-Line pumps are made as small as 4 inch bowls on a 4 inch motor for use in a 6 inch pipe to deliver 30 GPM. Larger sizes are available as required. For additional information write for free bulletin number 203.



In-Line Submersible

Layne SINCE 1882 — COMPLETE WATER SERVICE

LAYNE & BOWLER, INC., MEMPHIS

General Offices and Factory, Memphis 8, Tenn.

LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD

Sales Representatives in Major Cities

Find LAYNE Fast in the Yellow Pages under pumps

Planet-Drive "25" advantages add up fast—"feeding" 400-ton-per-hour aggregate plants

"400 tons of pit run gravel pushed into the conveyor daily—sometimes on pushes of 200—300 feet—is great production, and we are happy," states Ken Blattner, for D. H. Blattner & Sons, Albany, Minnesota. "The big TD-25 dozer gets its load faster, carries it along without wasting its power in steering —and it completes cycles faster and easier than we believed possible."

You see first-hand what happens when crawler "half-stopping" and load-dropping are eliminated —the first time you watch an International TD-25 round a curve under full load. You don't brake a track and half-kill your power to steer. "Dead-track drag" is eliminated—"live track" Planet Power-steering gives full-power momentum, full time.

Bank-cutting bladesful of gravel without nosing into the bank or sluing is another yardage-adding dividend of Planet Power steering. You equalize offset loading, keep full hp producing, with ease. Simply power-shift the "25's" load-side track to high speed range—leave the other track in low range—and take full bites where clutch-steered rigs only "nibble."

Use Planet Power steering to power-shift up on-the-go (wherever possible) or—power-shift down (wherever necessary)—to get maximum speed on every push. And you do it with a *standard equipment* feature. Hi-Lo power-shifting is another built-in bonus of the TD-25's planetary system!

With exclusive International DT-817 engine wallop, the "25" slugs along, 230 Turbocharged hp strong—without "slow-motion" lug-downs, even at high altitudes. No wonder single TD-25's, time and again, are feeding 400-ton-per-hr. aggregate plants!

See how fast Planet-Drive "25" advantages add up—in producing aggregates at minimum cost—as well as on heaviest bulldozing or push-loading. Prove what it means in production and profit to get TD-25 four-speed torque-converter efficiency range control. Let your International Construction Equipment Distributor demonstrate!

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

Because the TD-25 can side-cut gravel without time waste and has "live track" steering to deliver full loads to the crusher, this plant is in the 400-ton-per-hour class. The job: W. Hodgman & Sons, Inc., Fairmont, Minnesota, producing gravel for an experimental stretch of soil cement base state road.

With blade built-up to six feet high, this TD-25 (at 7,800 ft. altitude) drifts huge loads of gravel into the batch plant—maintains production of 410 tons per hour with ease. Fast TD-25 reversing up the steepest grades speeds the shuttle-cycle, increases capacity. Owner: Northwestern Engineering Co., Denver, Colorado—working on an Interstate road contract east of Evanston, Wyoming.

DIAMOND BLADE SAWING OF CONCRETE

Case Report: NORTH DAKOTA HIGHWAY

COST-$.132 per linear foot

TYPE OF WORK—Concrete Highway

AGGREGATE—Pit Gravel

SAWING OPERATION—Exclusively diamond blades.

TYPE OF DIAMOND—Engelhard Hanovia SND-MB.

DIMENSIONS—Longitudinal joint 2½" x ¼".
Transverse joint 2½" x ¼" on 20 ft. centers.

The efficiency of Diamond Blade Sawing operations in concrete highway and runway joint construction is unsurpassed. In addition, economy is acheived in the equally important matter of maintenance.

Savings in maintenance costs are reported as high as 50%. There's good reason for it because *only* the sawed joint can assure maximum uniformity of the concrete in the joint areas where 90% of pavement failures normally originate. Diamond Blade Sawing does not displace aggregate—it removes it and thus eliminates the basic cause of cracking, chipping and spalling.

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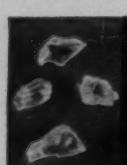

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Calendar

Beginning with this issue, a calendar covering events for the coming months will be a regular feature of the first issue of each month.

American Institute of Consulting Engineers, annual meeting, Engineers' Club, New York, Jan. 15. Write: AICE, 345 E. 45th St., New York, N. Y.

Engineers Joint Council, annual meeting, Biltmore Hotel, New York, Jan. 18. Write: EJC, 345 E. 45th St., New York, N. Y.

National Society of Professional Engineers, annual winter meeting, King Edward Hotel, Jackson, Miss., Jan. 25-27. Write: NSPE, 2029 K St., N.W., Washington 6, D. C.

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., semi-annual meeting, Chase-Park Plaza Hotel, St. Louis, Mo., Jan. 28-31. Write: ASHRAE, 234 5th Ave., New York, N. Y.

Associated Equipment Distributors, annual meeting, Hilton Hotel, Chicago, Ill., Jan. 28-Feb. 1. Write: AED, 30 E. Cedar St., Chicago 11, Ill.

Association of Asphalt Paving Technologists, annual meeting, Sheraton-Charles Hotel, New Orleans, La., Jan. 29-31. Write: AAPT, 1224 East Engineering Building, Box 619, Ann Arbor, Mich.

The Moles, annual award dinner, Waldorf-Astoria Hotel, New York, N. Y., Jan. 31. Write: The Moles, Biltmore Hotel, New York, N Y.

American Society for Testing and Materials, committee week, Hilton and Sheraton Dallas Hotels, Dallas, Tex., Feb. 5-9. Write: ASTM, 1916 Race St., Philadelphia 3, Pa.

National Sand & Gravel Association and **National Ready Mixed Concrete Association,** joint convention and equipment show, Conrad Hilton Hotel and McCormick Place Exhibition Center, Chicago, Ill., Feb. 5-9. Write: NSGA or NRMCA, Munsey Building, Washington 4, D. C.

National Crushed Stone Association, annual convention and exposition, Conrad Hilton Hotel, Chicago, Ill., Feb. 11-15. Write: NCSA, 1415 Elliot Pl., N.W., Washington 7, D. C.

Air-Conditioning and Refrigeration Institute, national exposition, Great Western Exhibit Center, Los Angeles, Calif., Feb. 12-15.

National Bituminous Concrete Association, annual convention, Flamingo Hotel, Las Vegas, Nev., Feb. 17-22. Write NBCA, 1145 19th St., N.W., Suite 408, Washington 6, D. C.

American Society of Civil Engineers, convention, Hotel Shamrock, Houston, Tex., Feb. 19-23. Write: ASCE, 345 E. 45th St., New York, N. Y.

Associated General Contractors of America, Inc., annual convention, Biltmore Hotel, Los Angeles, Calif., Feb. 26-Mar. 1. Write: AGC, 20th and E Sts., N.W., Washington, D. C.

American Road Builders Association, convention and highway materials and services exhibit, Sheraton-Palace Hotel, San Francisco, Calif., Mar. 4-7. Write: ARBA, 918 16th St., N.W., Washington 6, D. C.

American Concrete Institute, annual convention, Brown Palace Hotel, Denver, Colo., Mar. 12-15. Write: ACI, P. O. Box 4754, Reford Station, Detroit 19, Mich.

Association of Highway Officials of the North Atlantic States, annual convention, Roosevelt Hotel, New York, N. Y., Mar. 21-23.

American Welding Society, annual convention, Sheraton Cleveland Hotel, Cleveland, Ohio, Apr. 9-13, and show, Cleveland Public Auditorium, Apr. 10-12. Write: AWS, 345 E. 47th St., New York 17, N. Y.

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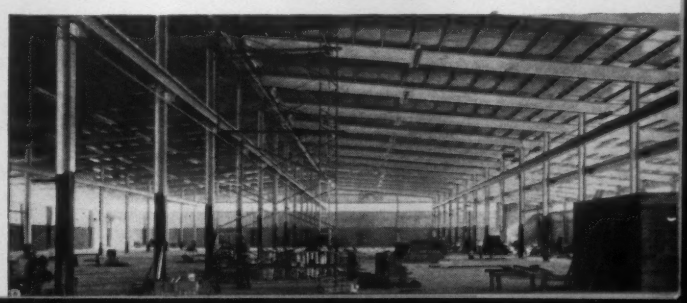

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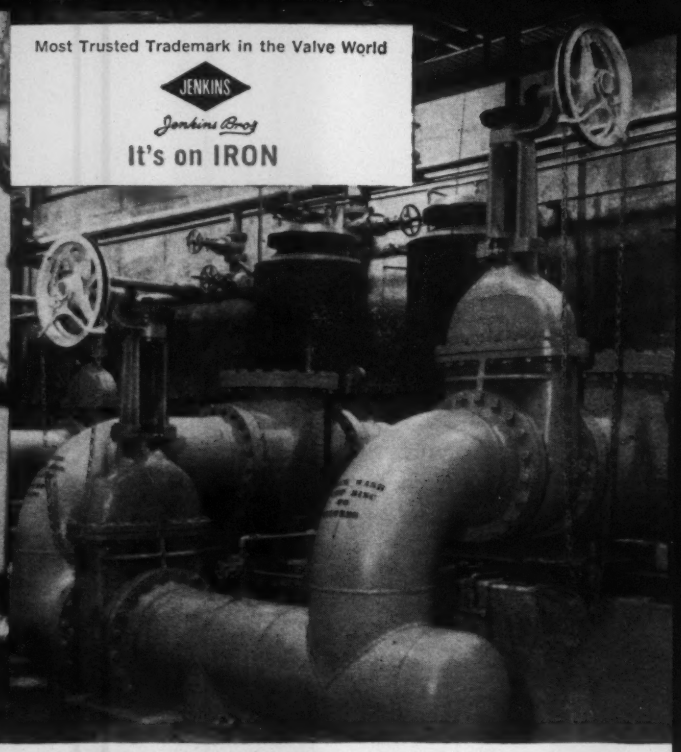

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

COMPARISONS ARE ODIOUS—Osborn T. Boyd, housing division chief of the U.S. Agency for International Development, commenting on Russia's poor housing conditions at a realtors' convention said, "I take great pleasure in pointing out to Communist delegates at international meetings . . . that in the U. S. our public housing is far more consistent with the principles of Marxism than theirs in Russia."

MAP MAKERS PLEASE NOTE—The Missouri River is now 2,367.2 miles long—97.2 miles shorter than 20 years ago and 173 miles shorter than when it was first surveyed in 1890—according to a Corps of Engineers resurvey. Channel straightening in the lower river—the cause of the shrinkage—is now about finished and the Missouri will shrink no more.

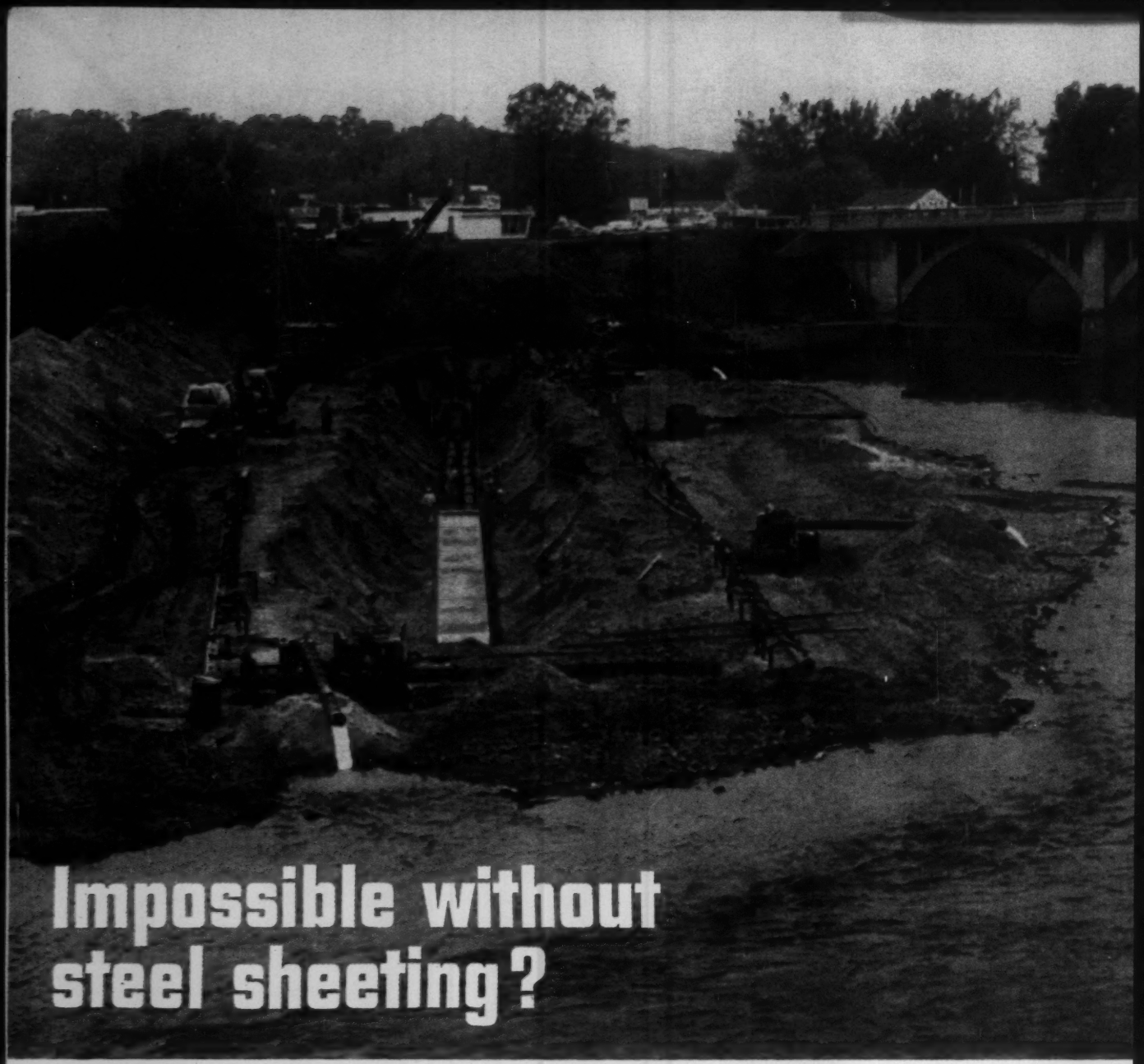
CONSTRUCTION MONITORS—Following an investigation of gifts and bribes to its construction staff, New York City's Board of Education appointed a committee of seven leading architects and engineers to advise on design and construction of schools. They will receive no salary and will not contract for any school work while they serve. Committee chairman is Max Abramovitz, director of planning for the UN and partner in Harrison & Abramovitz, architects.

ANOTHER CHANNEL CROSSING—To the tunnel and bridge ideas now under consideration as English Channel crossings, British Laborite Edwin Wainwright adds the suggestion to span the Channel with a power dam topped by a highway.

REACHING FOR THE SKY—The race for a height record continues unabated in Los Angeles since height restrictions were lifted in 1958. A 28-story skyscraper for California Federal Savings will be started next spring. It will equal the present record holder—the 28-story City Hall—but top two other hot contenders.

RACKET SHELTER—The Atlanta Better Business Bureau has proposed a code of ethics to govern fallout-shelter building and financing. Prohibited by the code would be scare-sales tactics, unwarranted builder claims of association with civil defense agencies, and shelters below the engineering standards of the civil defense specifications.

COUNTDOWN FOR COOPERATION?—Construction management officials from national and local levels are at work in Cocoa Beach, Fla., developing their half of a labor-management agreement aimed at stabilizing labor relations in the Cape Canaveral area. The unions have already drafted a tentative proposal. The pact may be worked out for submission to the Missile Sites Labor Commission by the end of the month.



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WASHINGTON OBSERVER

- **1.4 million housing starts seen for 1962**
- **Record construction spending predicted**
- **White House studies urban transit plan**

● **Housing experts in and out of government are optimistic about reaching 1.4 million new housing starts in 1962.** The estimate for this year, rapidly reaching a close, is 1.3 million. There already is some evidence that more liberal FHA terms are making it easier to sell new homes, and builders are expecting an upsurge in the spring. Money supply is no problem, nor are interest rates. Chiefly the bullish attitude stems from the general business improvement, which is expected to continue at least through next summer.

Construction costs are holding fairly steady. So is the average selling price of a new home. Chief reasons: Contractors are building lower-priced homes for special markets—minority and low-income groups, the elderly and newlyweds; productivity in the industry is on the rise; supplies of materials and labor are plentiful; competition is stiffer, and new techniques and materials are being used.

A major factor in the anticipated rise is the continued increase in construction of multi-family dwellings for rental purposes.

(Some top builders attending the homebuilders convention in Chicago this week figure that the Department of Commerce's prediction of 1.4 million housing starts for next year is on the low side. A few bet starts in '62 will come close to or even hit 1.5 million. A major factor in the improvement could be the 35-year mortgage. Some builders tell of lenders urging some 35-year financing—a sharp change in direction of just a short time ago when bankers generally said they wanted no part of 35-year mortgages.)

—

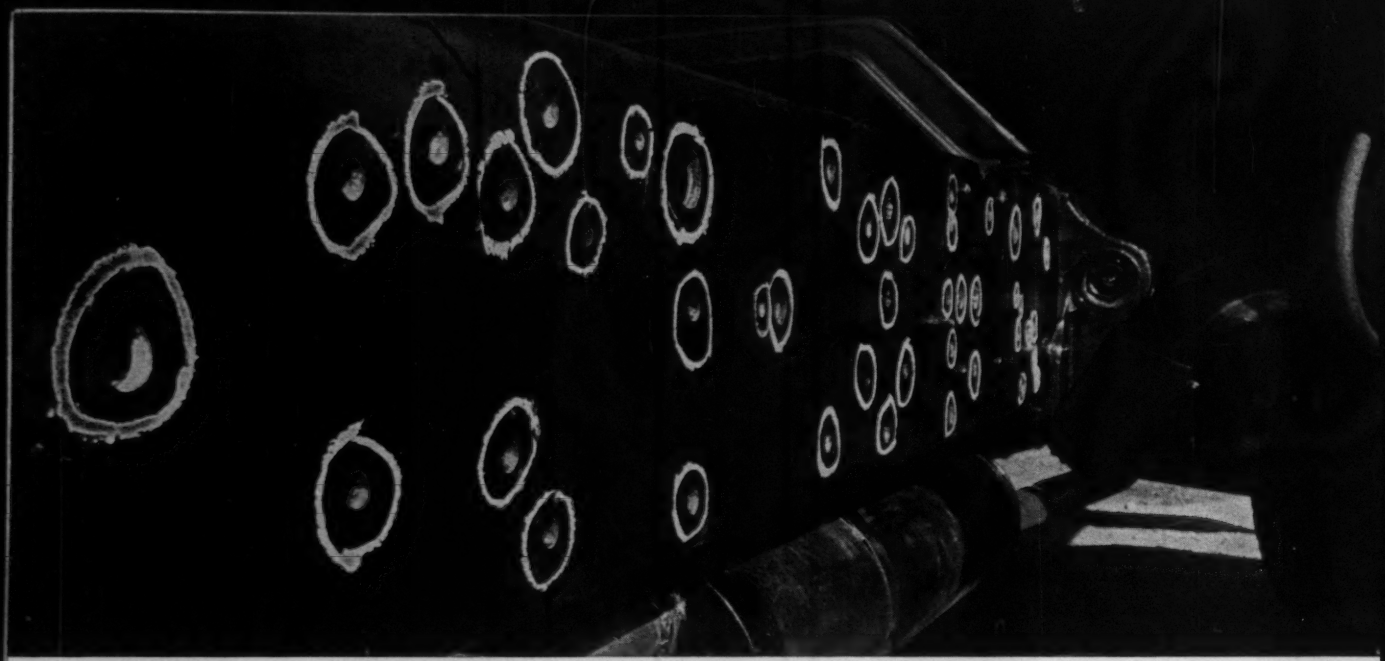
● **Increased housing starts will do their share in pushing construction expenditures to a record $60 billion next year.** This would be some 5% above estimates of $57 billion in 1961. The estimates are included in the government's annual Construction Industry Outlook, prepared by the Commerce Department's Business and Defense Services Administration (BDSA). The government's first 1962 estimate of spending on new plant and equipment, a separate document, is due out in a few days. The McGraw-Hill Plant and Equipment Survey forecasts a 4% rise next year (ENR Nov. 9, p. 23).

Federal aid will be a decisive, stimulating factor in construction, says BDSA. The over-all increase is estimated at 5%. But gains of from 7% to 14% are expected in residential housing, hospitals, highways and sewers, all of which get considerable federal aid in one form or another. Private construction spending next year is estimated at $42.3 billion, up $2 billion from this year. Public construction is estimated at $18 billion, up $1 billion.

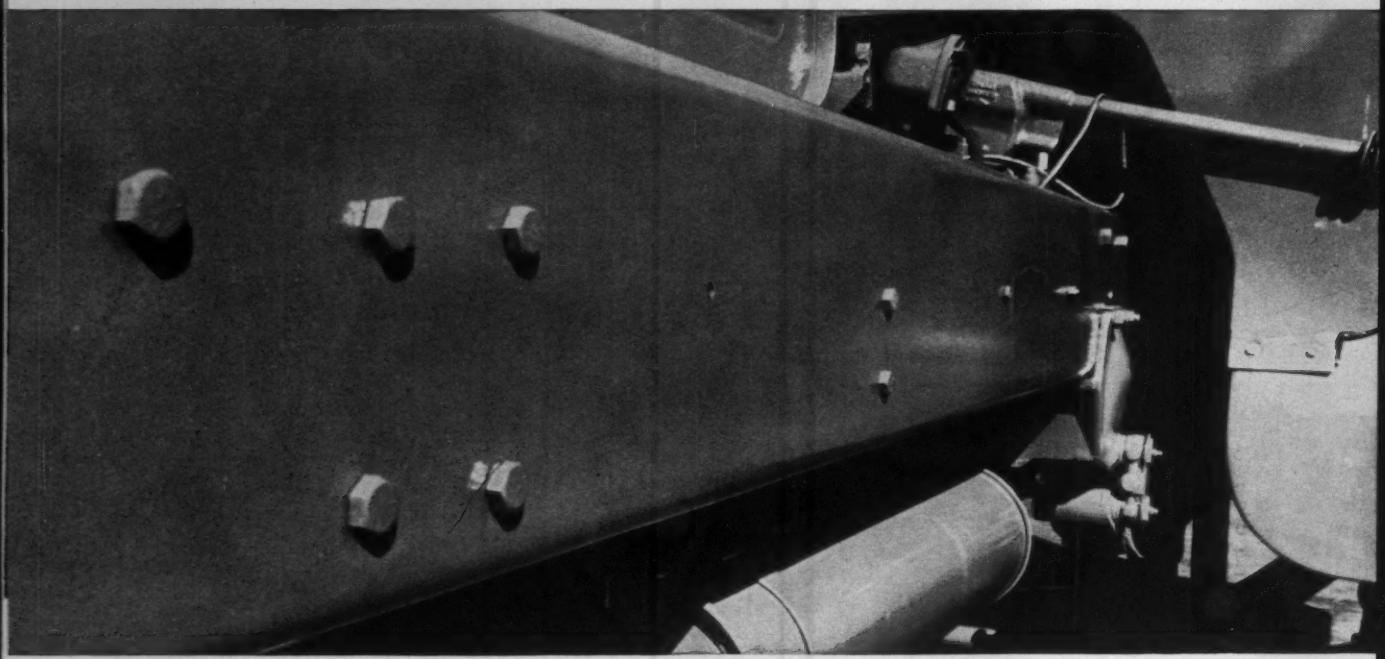
—

● **A 10-year, $2.5-billion federal-aid program to help cities solve urban transportation problems is under White House study.** This report probably will form the basis of Mr. Kennedy's recommendations to Congress next year.

Four methods of handling the federal aid are outlined in the report, but emphasis is on outright grants. The federal government would contribute 50% of costs, funneling aid through public agencies on a regional or metropolitan basis. The aid would go largely to commuter railroads and other types of rapid transit, since provisions to meet urban highway needs already have been made.



Chalk marks circle surplus holes in frame of mass-produced truck



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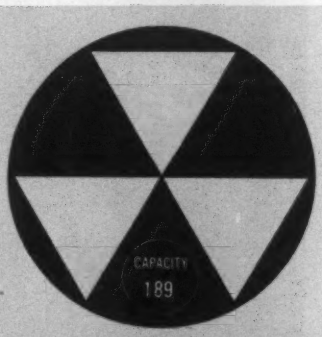
JFK Gets Definite on Shelters



- **Federal government is ahead of schedule in its program to locate potential community shelters.**
- **Washington will take lead in community shelters and begin converting space in federal buildings.**
- **Family shelter construction will get advice and encouragement, but no financial assistance.**

The Kennedy Administration tried last week to take some of the confusion out of the fallout shelter question.

President Kennedy at his press conference re-emphasized that the federal government would take responsibility, with state and local cooperation, only for a community shelter program. As to home shelters, he said, "Information will be made available to the individual as to what he could do within his own home." He declined to offer advice on whether a homeowner should build a shelter or not.

Two days later Assistant Secretary of Defense Steuart Pittman, in charge of civil defense, flatly urged construction of home shelters. "Everyone who has a back yard or a basement, and has the means to do it, should go ahead and build some construction that gives him the minimum shielding that is required." He said a pamphlet to be published within a month or so would show how to do this for as little as $150.

Meanwhile, the federal government announced it is running six months ahead of schedule on its program of finding, marking and stocking community fallout shelters (ENR Nov. 9, p. 21). Some 1,200 architects and engineers now have been trained in two-week or four-week courses on the techniques of building shelters or converting existing buildings. In the view of Mr. Pittman, this gives the U. S. "a body of technology" in civil defense problems for the first time. Another 800 engineers will be trained in the near future.

The defense department this week began letting the first contracts to architect-engineer firms to conduct the $93-million survey throughout the nation. All 700 contracts presently planned will be awarded by the end of December. Use of computers to analyze survey data is expected to facilitate completion of the survey by next summer instead of the previous target date of December 1962.

The federal government will take the leadership on community shelters by converting space in existing federal buildings to shelter space. The Defense Department has set aside $10 million from this year's $207-million civil defense appropriation to install fallout shelters in federal buildings built within the past 10 years. Those built in the past four years will get priority. This is expected to furnish shelter for 250,000 people.

Another $7.5 million has been earmarked to cover the cost of planning and construction of shelters in new federal buildings, offering shelter for an estimated 680,000 persons. Some $400,000 has already been allotted for shelter space in buildings now under construction in Chicago, Denver, Cincinnati and Pittsburgh. The next budget the President will send to Congress in January will include still more money for this purpose.

Mr. Pittman declined to reveal how much more money is being asked for civil defense next year over the current year. But he did estimate that the entire community shelter program now contemplated could be carried out for less than $250 million.

He said construction of "dual-purpose" shelters like underground garages "makes sense." But the federal government does not expect to provide any money for such combination projects, except on research to determine the best kind of protection.

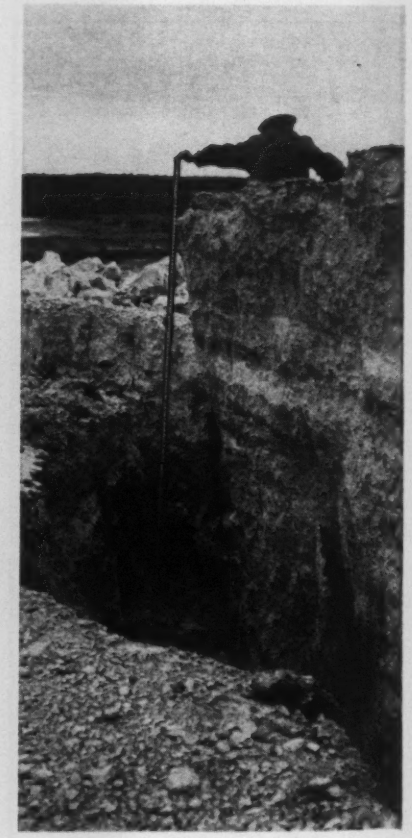
Mr. Pittman also admits a basic flaw in the community shelter program aimed at providing protection for 50 million people. He acknowledges that if cities are attacked, at least half of these shelters would be wiped out. But he asserts that since no one can tell what kind of attack would actually occur, the program is still worthwhile.

The Secretary sees no reason why construction of fallout shelters in private office buildings or factories should be delayed until further techniques of radiation protection are developed. There is enough expertise now among construction agencies, and enough information available from government sources, to enable architects and engineers to go ahead with construction of the larger type shelters.

There is no consideration being given to allowing tax deductions for shelters.

The President has been roundly criticized in the press for stirring up the civil defense pot and then providing no real answers. After the President's July 25 speech describing the necessity for shelters, the Administration vacillated on just how far it wanted to go. At a Thanksgiving weekend meeting at Hyannis Port the President and his aides finally shook down the conflicting proposals into the civil defense policy emphasizing community shelters. The pamphlet describing how to build home shelters is being toned down and trimmed in size.

A 1,000-ft section of Waco Dam sagged and slipped, leaving . . .



cracks and dislocations behind.

Dam Slide Laid to Rock Fault

Shifting foundation shale has been tagged as the cause of a sagging, slipping 1,000-ft section of Waco Dam on the Bosque River in Texas. Modification or complete redesign of the affected section of the nearly completed 12-million cu yd earthfill will be necessary.

The Fort Worth District of the Corps of Engineers says that investigations begun shortly after the dam began to crack last October have pinpointed two faults in the flood plain beneath the failed portion and have shown up a zone of weak fractured shale between the faults.

Investigations by Corps personnel and outside experts are continuing to determine whether the 140-ft-high embankment can be stabilized by large earth berms on the upstream and downstream faces. If not, then about 3 million cu yd of earth will have to be removed and replaced to correct the fault. Early guesses say repairs will increase the cost of the dam by $4 million.

Outside experts called in by the Corps are Arthur Casagrande, professor of soils mechanics at Harvard University; E. B. Burwell, consulting geologist of Washington, D. C.; H. B. Hill, consulting civil engineer of Minneapolis.

Trouble began early in October on the $38.5-million reservoir project when a section between the spillway and outlet works started cracking and slipping downstream (ENR Oct. 26, p. 17).

Movement reached a peak late in October covering a 1,000-ft to 1,200-ft stretch of the 18,000-ft embankment. Alluvial materials bulged, ruptured and cracked as far as 770 ft downstream from the dam's axis. Large-scale motion halted after the section slipped 22 ft vertically and 21 ft downstream. By this time, most work on the entire project was halted and the Corps set out to determine the cause of the failure.

Col. R. P. West, Fort Worth, District Engineer, admitted that the Corps had been "aware of the possibility of some minor faulting in the embankment foundation prior to construction." He added, however, that preconstruction underground investigations revealed neither the exact location nor the extent of the faulting.

The Corps doubts that it can make the repairs and still meet the scheduled 1964 completion date. Colonel West says it will "probably" be necessary to terminate the $5.4-million contract for spillway construction held by Elmer C. Gardner, Inc., Houston. Gardner has completed about 15% of his work. Colonel West says that although there are "no apparent problems in the spillway area," they are taking "another good hard look" at the spillway design.

Waco Dam was designed by the Corps to expand the 31-year-old Waco City Water Works reservoir. (The original dam had its troubles too—in 1947, a major washout of the spillway apron forced a 'round-the-clock, 40-day job installing a new apron.) The new dam is essentially a homogeneous impervious fill. Beneath the downstream toe is a heavy drainage blanket connected to an inclined drainage blanket that extends to the height of the spillway crest.

Fill was spread in loose lifts not more than 8 in. thick and then compacted by four passes of a heavy tamping roller followed by two passes of a 50-ton pneumatic tire roller. Embankment materials were all local sandy clay and broken-up shale from the spillway excavation.

Planners Stress Transit At Annual Convention

The need for stronger federal action to improve urban mass transit proved the dominant theme at last week's American Institute of Planners' Convention in Detroit.

Generous federal assistance for freeways "stacks the cards in the favor of the most costly and inefficient means of transportation," said Lyle C. Fitch, president of the Institute for Public Administration.

"When a community is faced with a choice between 90% highway aid and 10% transit money, its choice is obvious," said Mr. Fitch.

A report released several days after Mr. Fitch's speech unveiled a proposal by his organization for a 10-year, $2.5-billion aid program to aid cities in planning, reviving and building mass transit systems. The Institute of Public Administration made a study for the Commerce Department and the Housing and Home Finance Agency.

American cities have already requested transit aid totaling more than four times the amount that Congress approved for the program's first year. HHFA Administrator Robert C. Weaver reported that the cities have applied for $300 million in loans and $40 million in grants. Many cities are considering integrated transportation systems, with rapid transit lines on expressway routes, said Mr. Weaver.

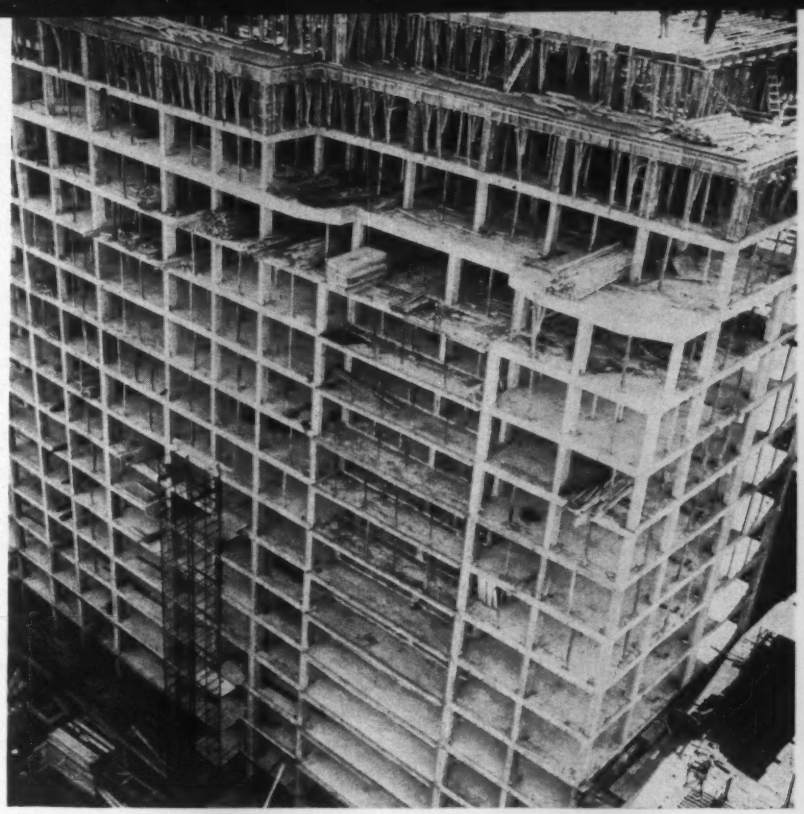
Monorail Firm Proposes L. A. Rapid Transit System

Alweg Monorail Systems, a subsidiary of Wegematic Corp., of New York City, has offered a plan (ENR Nov. 23, p. 17) to the Los Angeles Metropolitan Transit Authority to finance and build a 14-mile, $63-million, high-speed monorail rapid transit system.

The firm's offer, which will remain open for 90 days, calls for construction of a route linking West Los Angeles and a downtown point near Union Station. The recommended system would run down the center of Wilshire Blvd. on supports capable of carrying monorail trains at speeds up to 70 mph.

R. Gilman Smith, New York City engineering consultant, says either route would permit transit riders to travel from one end of the system to the other in 20 to 25 minutes.

But already the plan has run into strong opposition. Property owners along the route proposed for the center of Wilshire Blvd. brand the overhead system unacceptable. And MTA members indicate they still favor the combined subway-surface route contained in their proposed 23-mile backbone system, estimated to cost $192 million (ENR Aug. 10, p. 22).



Builder sets 19th floor forms in eighth week after . . .

Casting Three Stories a Week

An owner-contractor has just built in only eight weeks a 19-story concrete superstructure for Prevost House, an apartment house in New York City. Except at offset floors near the top of the building, he hit a record-setting pace of three stories a week.

The need for speed is explained by the contractor's chief engineer, Bill Maltz:

"We started work in September at the end of a teamsters' strike that had cut off concrete supplies to the city. We wanted to be ahead, so that if all the other contractors started and finished together we would have no trouble in getting finishing trades. Furthermore, winter wasn't far off, and we didn't want the added cost of winter concrete construction. And as owners of the apartment building, we wanted the place to start earning income as soon as possible."

The flat-slab structure has no beams or drop panels. This encouraged Mr. Maltz to plan on using two sets of forms, and cast three floors a week. He scheduled the first 200 x 70-ft floor to be cast on September 22, and the roof on November 15. The building was topped out on November 16, because of heavy rain on the scheduled date.

Key to the operation was the concrete mix. With the engineer's approval high-early-strength cement was used. The contractor used a 3,500-psi mix in the slab and a 4,000-psi mix in the columns and edge beams.

The work cycle was as follows:

- First day, erect forms for complete floor. Place inserts and lay reinforcing.
- Second day, cast concrete columns and slab.
- Third day, erect next floor's formwork and lay reinforcing steel.
- Fourth day, cast this floor, strip forms from previous floor and reshore.

On this pattern, 48 hours elapsed between casting the concrete and removing the formwork. Shores were put under the slabs immediately after the forms were taken out. Marks made by shores on the green concrete were removed later by grinding the surface.

Asked why he thought the tightly packed schedule was successfully maintained, job superintendent Harry Griffin said, "The subcontractors joined us in the race to finish on target. They were as excited about the rapid rise as we were."

The $5-million building will be enclosed by Christmas and ready for occupancy next June.

Philip Birnbaum is architect for Prevost House and Leon Seltzer, the structural engineer. George Rosen Corp., is the general contractor. Barnaby Concrete Corp., is the subcontractor for the formwork, reinforcing and concreting. All firms are from New York City.

Potomac River Development Considered

Public hearings are now under way on four alternative proposals for development of the Potomac River Basin as outlined by the Baltimore District, Corps of Engineers.

The 50-year plans all have the same objective—comprehensive development of the basin's water supply, flood control and recreational potentials. They range from a 12-dam, $425-million program to a 20-dam, $506-million scheme. Benefits to which dollar value can be assigned are roughly equal for all plans —$31-32 million a year, according to Corps estimates.

From these tentative plans, or some variation of them, the Corps will develop a final recommendation to Congress for development of the 14,670-sq-mi Potomac Basin.

Of the four plans outlined, the Main Stem and Upper Basin Plan involves the least number of reservoirs and has the lowest price tag, but up to now, it has met with considerable opposition from several quarters.

Big disadvantage, opponents say, is the location of the key reservoir on the main-stem Potomac at Riverbend, not far from Washington, D. C. The Riverbend Reservoir would back up the river nearly to Harpers Ferry and flood about 35 miles of the old Chesapeake & Ohio Canal, a popular recreation area and historical landmark. This is raising hackles all along the Potomac.

Also authorities in both Maryland and Virginia are worried over the loss of valuable real estate caused by a large main-stem reservoir.

The Corps, on the other hand, claims the Riverbend site would provide excellent control of the river during both low flow and flood stages for the Washington metropolitan area; provide the most storage of any site in the basin at the least unit cost; make possible large water releases with very little pool fluctuation because of the reservoir's size; and provide the Capital with a much cleaner looking river due to silt deposition behind the dam.

The Main Stem Plan spots the reservoirs closest to the points of need, according to the Corps, and in the areas of greatest potential flood damage, provides the most flood control of any of the plans.

With an eye towards the canal-preserving campaign, the Corps points to a possible variation within the Main Stem Plan. The main-stem reservoir could be built four miles farther upstream with only slightly reduced flood control benefits and no effect on other benefits. This would save a portion of the 110-year-old canal and $17 million in project costs, making this modified plan the least expensive of any of the four basic plans.

The three major alternatives eliminate one or more big downstream reservoirs and substitute more, but smaller, tributory reservoirs. The three plans include 17, 18, and 20 dams and would cost $484 million, $478 million and $506 million respectively.

None of the basic plans call for immediate construction of all the major reservoirs. Work would be spread out over 50 years as the need developed.

All the plans presuppose 80% to 90% effective treatment of sewage and other wastes throughout the basin and include construction of about 400 small headwater impoundments, at a cost of $106 million, for local flood control and other water needs.

The Corps stresses that the Main Stem and Upper Basin Plan will take care of most of the basin's water needs for the next 50 years and still leave room for expansion after that time. But the alternative plans, while providing adequate water through 2010, involve development of almost all the potential sites in the basin so that the only future expansion would be by reconsidering the big downstream sites.

Flood control benefits, particularly for the Washington metropolitan area, decrease when the main-stem reservoir

BRI Convention Emphasizes Construction

Exhibiting a nice sense of timing, the Building Research Institute held a comprehensive session on Design for the Nuclear Age at its annual fall conference last week in Washington, D. C. And the Institute's program planners were not merely exploiting the currently aroused interest in fallout shelters; they had their subject chosen last year.

The three-day program still covered the wide range of topics characteristic of BRI conventions. Such subjects as plastic building products, prefinishing of factory-made building components, building cost analysis methods, and mechanical fasteners for wood also commanded members' attention.

The multipurpose building, combining ordinary uses with protective features, will monopolize building design for the nuclear age. The speakers grappling with the technical problems of designing against thermonuclear attack agreed that construction economics imposes this type of design on us in the vast majority of cases.

School buildings comprise the most important and practical kinds of buildings for multipurpose design, according to architect Lyndon Welch, of Eberle M. Smith Associates, Inc., of Detroit. Describing school designs prepared by his firm for the old Office of Civilian and Defense Mobilization, Mr. Welch noted the need for building code revisions to permit such things as basement classrooms.

Mr. Welch described several schools designed for the stringent factor of 5000 for radioactive fallout protection. One such design featured a partially depressed basement surrounded by an earth embankment providing economical shielding.

The high cost of blast doors and blast valves to protect the ventilating system from excessive over-pressure poses the main economic obstacle to blast-resistant construction, reported Mr. Welch. He estimates the cost of these accessories at about five times the structural cost of "hardening" the school buildings to withstand over-pressures ranging from 5 to 15 psi. (Roughly, the over-pressure exerted by a 10-megaton bomb exploded three miles away.)

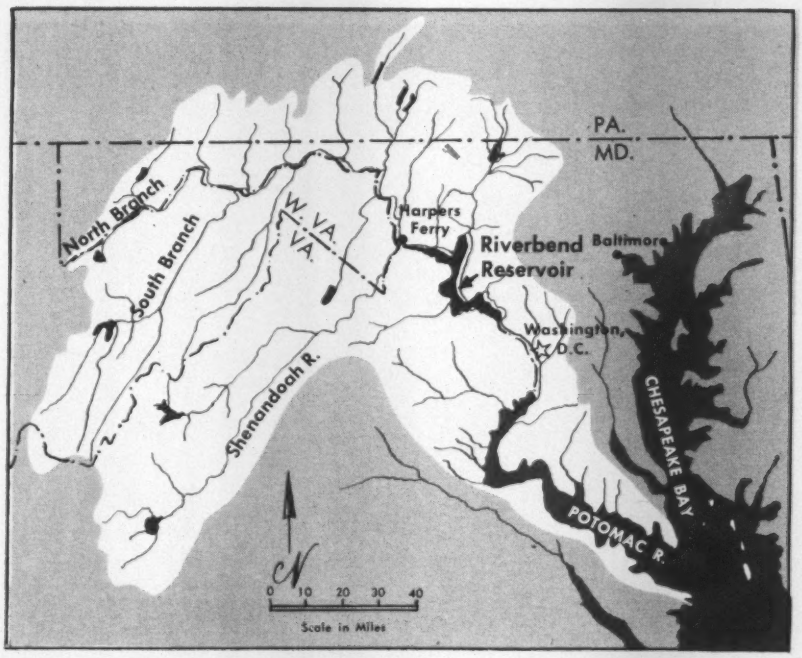
Mr. Welch recommended designing fallout shelters with minimum number of openings of smallest possible size. This eases the problem of adding blast closures in case the structure is redesigned for blast resistance.

Darrel D. Rippeteau, a partner in Sargent, Webster, Crenshaw & Folley, Syracuse architects, sees in multipurpose design some hitherto poorly exploited advantages of underground construction.

For example, manufacturing processes requiring close temperature, humidity and dust control thrive underground, where environmental controls are more easily and economically maintained. Underground construction reduces energy requirements for summer air-conditioning and winter heating.

A typical multipurpose manufacturing plant of this type might have 30% of the total building volume above grade—e.g., shipping and receiving facilities and personnel administration.

The glass-walled skyscraper is an anachronism in the nuclear age, said Mr. Rippeteau. Thicker walls with less glass and more subgrade construction



Riverbend Reservoir (arrow) is source of controversy.

is eliminated. Although additional dams are added in each successive plan, the reservoirs are located farther and farther from Washington, hence, both flood control and water supply benefits for Washington decrease as distances from the city increase, according to the Corps.

After the public hearings, the District Engineer will select the best plan, or combination of plans, and send it to the North Atlantic Division Office. From there it goes to the Board of Engineers for Rivers and Harbors, the Chief of Engineers, and finally to Congress.

for the Nuclear Age

will mark the design of office buildings.

Leaving the grubby technical details of fallout shelters to others, Prof. F. W. Edmondson of Cornell University's School of Architecture soared out to the boundaries of technological possibilities with his description of nuclear-age cities.

Planning Utopias is a more practical pursuit today than it was in the pre-scientific era, said Professor Edmondson, who sees a dim future for today's cities. "Our old cities are reacting weakly to the surgical concept of renewal . . . . The organs of social and mechanical functions are diseased and intravenous feeding of federal, state and private finance simply extends disability payments for a few more years. We will build new cities, radically different," he said.

Professor Edmondson described a proposal for a compact city called NEUS, a governmental core city of 150,000 population for the future megalopolis of the northeastern U. S. One-third of this city, designed for protection against thermonuclear, chemical and bacteriological weapons, would be underground.

NEUS would be self-sufficient, with an enclosed, controlled environment, nuclear power and air-borne transit.

The search for better roofing materials was a major focal point of the sessions on plastics. Architects are looking for improved roofing for flat as well as curved surfaces, said Walter S. Young of Owens-Corning Fiberglas Corp.

Mr. Young reported on a material called polyisobutylene, a glass-fiber reinforced plastic highly inert chemically. Research tests and trials on actual roofs have shown this material to provide excellent waterproofing and weather resistance, but a tendency to puncture. Owens-Corning is presently working on a self-sealing, self-adhering backing to eliminate this difficulty.

Performance of another new roofing material – neoprene-Hypalon synthetic rubber–was reported by John J. McEvoy of du Pont. This roofing has performed well in scattered locations over the country, said Mr. McEvoy. He praised the material especially for curved roof surfaces, where it minimizes flashing problems at the eaves.

Photogrammetry Firms Figure in Mergers

Three large photogrammetric mapping companies have hit the merger trail.

Two weeks ago Aero Service Corp. of Philadelphia was acquired by Litton Industries, which in addition to its electronic manufacturing divisions also owns Western Geophysical Co. And on December 12, stockholders of both Geotechnics & Resources Inc. of White Plains, N. Y., and Jack Ammann Inc. of San Antonio, Tex., will vote on a proposal that Geotechnics acquire the Ammann company.

Terms of the Geotechnics-Ammann merger call for an exchange of stock at the rate of two of Geotechnics for each one of Ammann, plus $450,000 in cash to be paid to the Ammann estate. Of the cash, $350,000 would be a deferred payment. Geotechnics' volume runs to about $330,000 a year; Ammann's about $1.2 million annually. Geotechnics will be the surviving company.

Terms of the Litton-Aero purchase were not disclosed, although stock was involved. Aero's annual revenues run to $10 million. Litton's sales in the 1961 fiscal year ended July 31 totaled more than $250 million.

Code Changes Ahead For Steel and Concrete

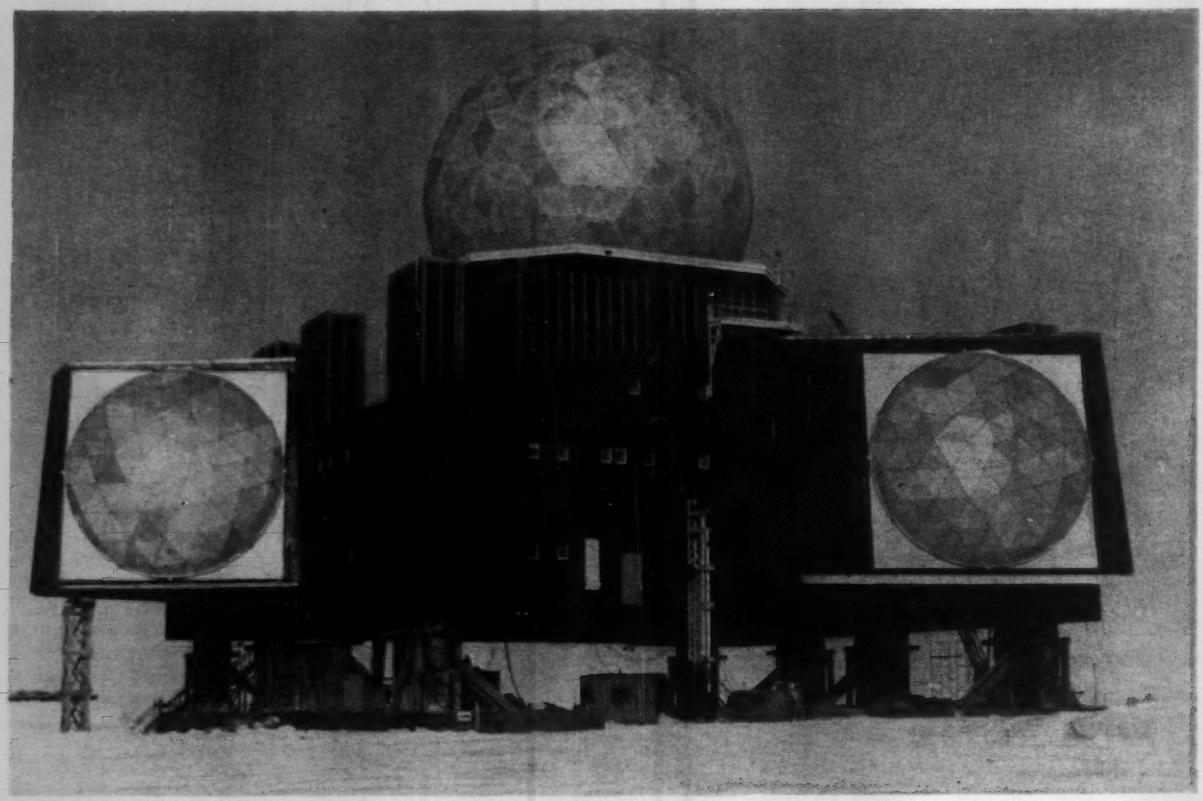
Look for major changes early next year in model-code requirements for structural steel and concrete.

The American Institute of Steel Construction will unveil next month an updated specification for the Design, Fabrication and Erection of Structural Steel for Buildings. Previews will be given in Chicago, January 11 and 12; New York City, January 15; San Francisco, January 17; Dallas, January 19.

The revised specification will extend coverage to plastic design, composite construction and high-strength structural steels. It will give new formulas for thin-web plate girders and for columns. And it will permit improved connection methods.

The American Concrete Institute will take up proposed changes in its building-code requirements for concrete (ACI Standard 318-56) during the annual meeting in Denver, March 12 to 15.

Certain to be included in the proposal are requirements for high-strength reinforcing steel and prestressed concrete. Ultimate-strength design will be shifted from an appendix into the main body of the code. Other proposed changes will cover details of reinforcing steel, effective length of columns, design methods for flat-slab floors, requirements for precast concrete and allowable stresses, including shear and bond.



Greenland icecap building on jacks is one reason why . . .

DEW Line Contractors Win Praise

The two construction contractors who built the four Distant Early Warning Line (DEW Line) stations on Greenland were awarded Certificates of Appreciation by the Department of the Army last week.

Brig. Gen. Thomas H. Lipscomb, head of the Corps of Engineers North Atlantic Division made the awards to Peter Kiewit Sons' Co. and to Danish Arctic Contractors for "outstanding performance under conditions of great difficulty."

The Kiewit company completed two stations on the icecap two months ahead of schedule, while the Danish firm, a combine of six construction companies from Denmark, beat their schedule by a month in constructing stations at remote locations on the east and west coasts.

The construction of these stations as well as the huge antenna of the Ballistic Missile Early Warning Station farther north at Thule (also the responsibility of the Kiewit firm as sponsor of a four-company joint venture) was described in ENR Dec. 24, 1959.

Most unusual of the DEW Line structures were the buildings on the icecap, founded on spread footings dug deep into the snow and supported by steel columns each equipped with two 350-ton jacks. Operated from a central control, the jacks can raise the 133x144-ft building, so that regardless of snow accumulations, a 20-ft clearance can be maintained and the hazard of drifting snow eliminated.

The building, designed by Metcalf & Eddy, consulting engineers of Boston, is framed with steel roof trusses from which the two floors are suspended and on top of which the main 68-ft-dia radome housing the surveillance antenna is supported. The smaller radomes at the sides of the building enclose dish-type communications antennas.

Curved Walls for Foggy Bottom

A $45-million commercial-residential project has been proposed to occupy a 10-acre site in Washington, D. C.'s Foggy Bottom, adjoining the proposed $61-million National Culture Center on the Potomac (ENR Dec. 3, 1959, p. 29).

Designed by architect Luigi Moretti of Rome, the project features a cluster of sinuous highrise buildings, one shaped like a crescent and topped with terraced roof gardens.

Three of the five major buildings would contain 1,400 dwellings units; a residential hotel would contain 350 dwelling units; and an office building would have 200,000 sq ft of office space. Parking space with access by ramps and tunnels and community shopping facilities would be located underground.

Some villas and duplex homes with roof terraces also would be scattered through the landscaped site.

The developers have applied for zoning variances to permit construction of the office building and also to raise present building-height limit for the area to 130 ft.

Associate architect is Milton Fischer of Corning, Moore, Elmore & Fischer of Washington. Chief sponsor is Societa Generale Immobilaire of Rome, the developer of Montreal's $90-million Victoria Square project (ENR Oct. 26, p. 48).

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...for steel or copper pipe
...with or without locking nut

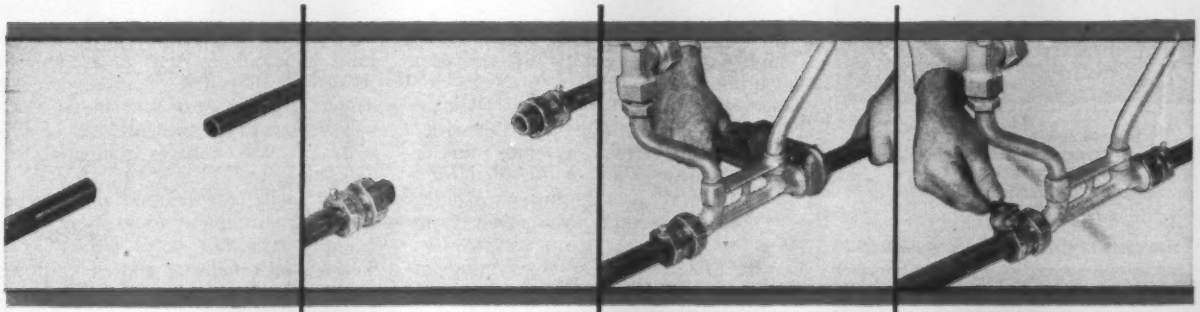
You can now install Mueller Copper Meter Yokes in any existing steel or copper piping in just a few minutes — and without cutting threads or sweating joints.

The simple step-by-step procedure for installing a yoke with Mueller's new Compression Couplings is shown below. Permanent, water-tight joints are quickly made even on rough and badly pitted pipe. Possible trouble is avoided because the piping does not have to be moved.

These new, time-saving couplings are now available for all Mueller Copper Meter Yokes with Multi-Purpose Ends. Regular compression nut or locking nut designs can be furnished for steel or copper pipe.

The locking nut type (shown) positively prevents any movement of the yoke on the pipe and insures continuous electrical bonding of the service piping.

Write for complete information and specifications on Mueller's Copper Meter Yokes.



1 Clean dirt, rust and scale from pipe and cut out a section just slightly longer than yoke (without coupling).

2 Remove all burrs from inside and outside of pipe and slip complete coupling over cleaned ends of pipe.

3 Align yoke between ends of pipe, slide couplings into place and tighten couplings securely onto yoke body.

4 Tighten compression nuts on pipe and lock yoke in place by tightening locking set screw on clamp. Setting complete.

Copper Meter Yokes are just a portion of Mueller's complete line of quality-matched meter setting equipment.

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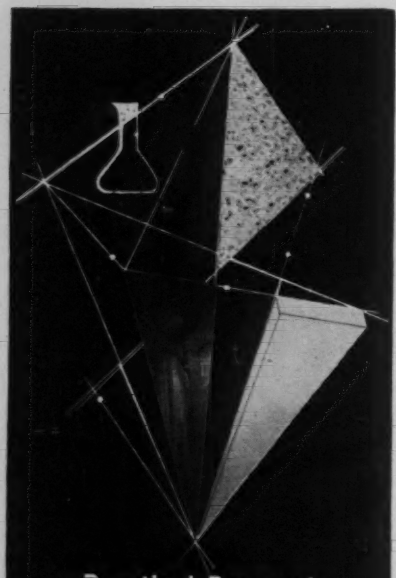

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Demand for Engineers to Double...

The number of jobs in the construction industry for engineers and scientists will more than double in the next 10 years.

Construction now employs 52,800 engineers and 900 scientists, but by 1970 the industry will demand 108,700 engineers and 1,900 scientists. Technicians employed, as distinct from engineers, will also increase from 21,200 now to 43,600 in 1970.

These estimates of jobs held and future demand show up in a study made by the U. S. Bureau of Labor Statistics for the National Science Foundation, Washington, D. C.

In mining and in manufacturing, the increases will be as large or larger. Mining, which now employs only 18,000 engineers will require 55,800 in 1970. And manufacturing, employing 440,300 engineers now, will provide jobs for 904,400 in 1970.

Transportation, communication and public utilities also will boost their total needs from the present 56,800 engineers to 80,700. Engineering and architectural services in which engineering employment now stands at 53,500, will call for an estimated 68,700 engineers in 1970.

If the number of engineers employed by miscellaneous business and nonmanufacturing companies are added to the previous totals, the total engineering population in industry at present comes to 648,500, a total that will increase to 1,270,400 in 1970. This total, however, includes industry only.

Engineers employed in colleges and universities now number 24,200. By 1970 the figure will increase to 38,100. In government at all levels, the 10-year growth for engineering is estimated as follows: federal, from 53,900 to 77,700; state, from 28,200 to 52,200; local, from 24,000 to 39,700.

The study results from an NSF attempt to develop a systematic method for projecting the long-range demand for all kinds of scientific and technical personnel.

From studies by the BLS, there were known the ratios of scientific and engineering employment to total employment in various sectors of the economy from the years 1954, 1957, 1958 and 1959. The Bureau had also developed projections for total employment in these sectors in 1970. NSF, assuming that something like the ratios existing in the 1950 decade would continue in the 1960s, developed a ratio for scientists and engineers to total employment that would be applicable in 1970.

Using this ratio the first rough figures were obtained. These were refined after a detailed study was made of 65 firms in the chemical and electric equipment industries, during which the rough figures and the trends upon which they were based were checked by these employers.

It is pointed out that the results of the study can only be regarded as rough approximations, subject to checking and revision as new information becomes available.

... But the Supply Heads Down

While the demand for engineers promises to rise sharply by 1970, the supply of new talent to the profession may diminish.

Enrollments of freshmen at engineering colleges throughout the nation show a drop both in absolute numbers and as a proportion of the total freshman population, according to a report by the Engineering Manpower Commission.

In 1960, freshmen engineering enrollment of 67,500 represented only 7.3% of total freshmen enrollment of 929,800. In 1957, engineering freshmen enrollment equalled 10.8% of all freshmen.

This year's drop of 2.3% in the number of engineering enrollments continues a trend started in 1958. That year, engineering enrollment fell 11.1% from 1957 to 70,000, followed in 1959 by a 3½% decline to 67,700. In 1960, enrollment dipped fractionally; only 0.3% to 67,500. This decline occurred in the face of a climb in all college freshmen enrollments for all courses.

EMC, an agency of the Engineers Joint Council says that as a result of the enrollment slide, first engineering degrees for the next four to six years will be below the present level of 37,800. In 1950, colleges graduated 52,700 engineers.

Regionally, the sharpest drop in engineering enrollment took place in the Middle Atlantic states—6.6%. The West South Central states registered the smallest dip, one of 0.3%. Three regions, did show increases in enrollment; the Pacific states up 6.4%, East South Central up 3.3% and the Mountain states up 3%.

Engineering Manpower Commission predicts that the nation soon will feel the impact of continued low enrollments and graduations of engineering students. The agency points out that graduate engineers already command starting salaries $50 to $125 per month higher than those paid to liberal arts and business graduates.

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I	Beams: 6" to 12" inclusive	American Standard Sections and Foot Weights*
[	Channels: 6" to 15" inclusive	American Standard Sections and Foot Weights*
L	Equal Angles: 3" to 8" inclusive	Standard Sections*
L	Unequal Angles: 3½" x 3" to 8" x 6" inclusive	Standard Sections*

*See our booklet, "USS Shapes & Plates," ADUCO-27001

Maximum length 40' for all sections

Mechanical Properties of Quenched and Tempered Alloy and Armor Steel Structural Shapes

	Yield Strength, psi	Tensile Strength, psi	Elong. in 2", % min.	Reduction of Area, % min.	Longitudinal Charpy Impact (when specified)	
					Keyhole	V-notch
"T-1" Steel 2½" and Under	100,000 min.	115,000/140,000	18	55①	15 ft.-lbs. @ −50F	30 ft.-lbs. @ +10F
"T-1" type A 1" and Under	100,000 min.	115,000/140,000	18	55①	15 ft.-lbs. @ −50F	—
Grade A 9% Nickel	60,000 min.	90,000 min.	22% min.	—	15 ft.-lbs. @ −320F	20 ft.-lbs. @ −320F
Grade B 9% Nickel	65,000 min.	95,000 min.	20% min.			
HY-80 ¼"-2" Incl.	80,000/100,000②	—	19③	—	—	70 ft.-lbs. @ −120F

①¾" and under—45% min.
②½" and over, yield strength range is 80/95,000 psi
③½" to 2" inclusive, elongation 20% min.

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NEW METHODS, NEW MACHINES PUT SECTIONS OF INTERSTATE

40% AHEAD OF SCHEDULE...

Tandem loading with new power shift D9G speeds job for Greer Bros. & Young

The job is a big one: 5,000,000 yards to be moved on two adjoining sections of Interstate 75, just out of Jellico, Tenn. Terrain: hilly. Haul distance: 1600 feet. Soil: mostly clay and shale, with considerable ripping required. Time schedule: 300 days.

The London, Ky., firm has teamed new machines with new methods to meet the challenge. For example, the use of tandem pushers has resulted in 21 bank-yards (on adverse grades) in .6 to .8 of a minute. In this case, a new 385 HP Cat D9G Tractor was used in tandem with a D8H to load out new Cat 631 Tractor Scrapers.

"Tandem loading production has been boosted 25% with this D9G, as compared with an older torque converter D9," reports W. C. Howard, chief engineer on the job.

"We notice a big difference in power, weight and traction with this new machine. Cushion bulldozer and push block help, too. They give us on-the-go scraper contact—this cuts down on approach time. By reducing contact shock, we expect better scraper life. Tandem loading with the new D9G has helped us pull 40% ahead of schedule."

The new D9G has a number of pluses that make it right for dozing and ripping, as well as pushing. Here are only a few:

Engine delivers 385 flywheel HP—100 more horsepower than the first D9 . . . weight is 64,800 pounds, 14% more than the first D9 . . . a massive, heavy-duty undercarriage lets the D9G take on the toughest ripping job . . . a power train with built-in ruggedness also has unit construction for fast servicing.

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Greer Bros. & Young also use the D9G, equipped with 9C Dozer, to clean up the cut.

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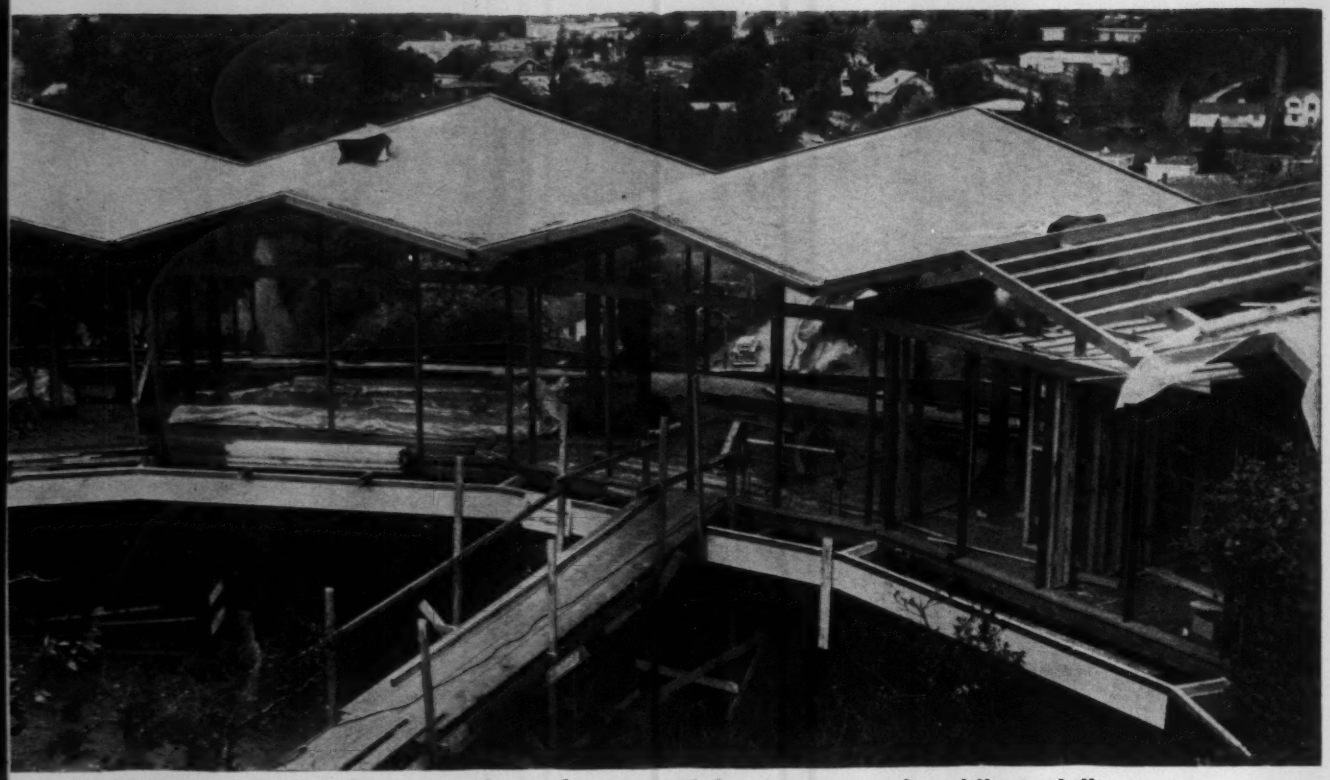
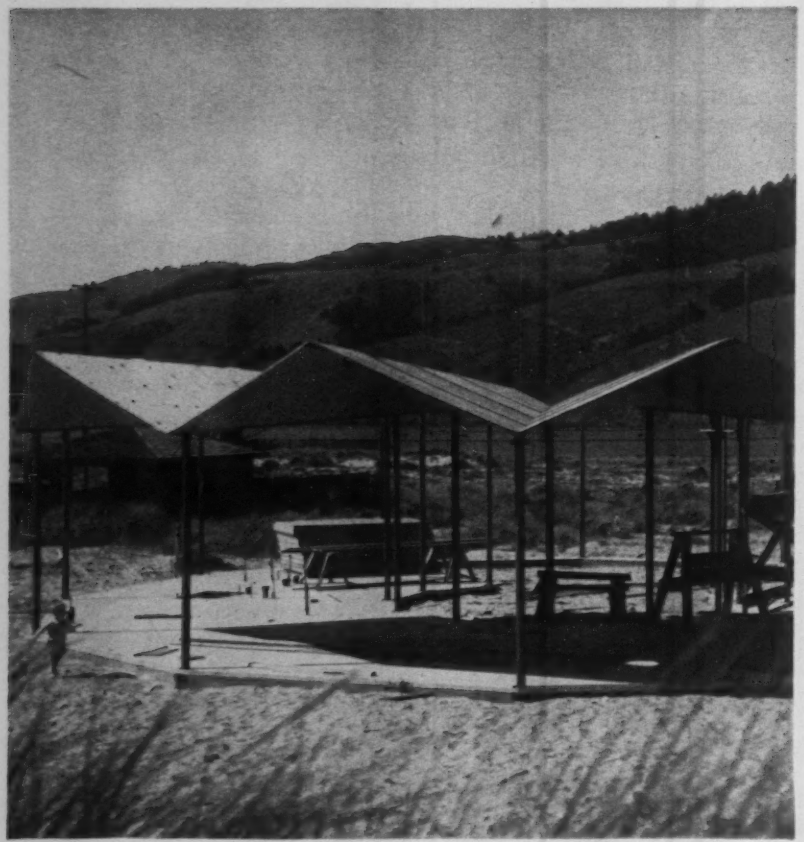


Rigid-steel-frames form six identical trapezoidal rooms around saddle in hill.



Steel angles and pipe columns support folded-plate roof.

Steel Framing

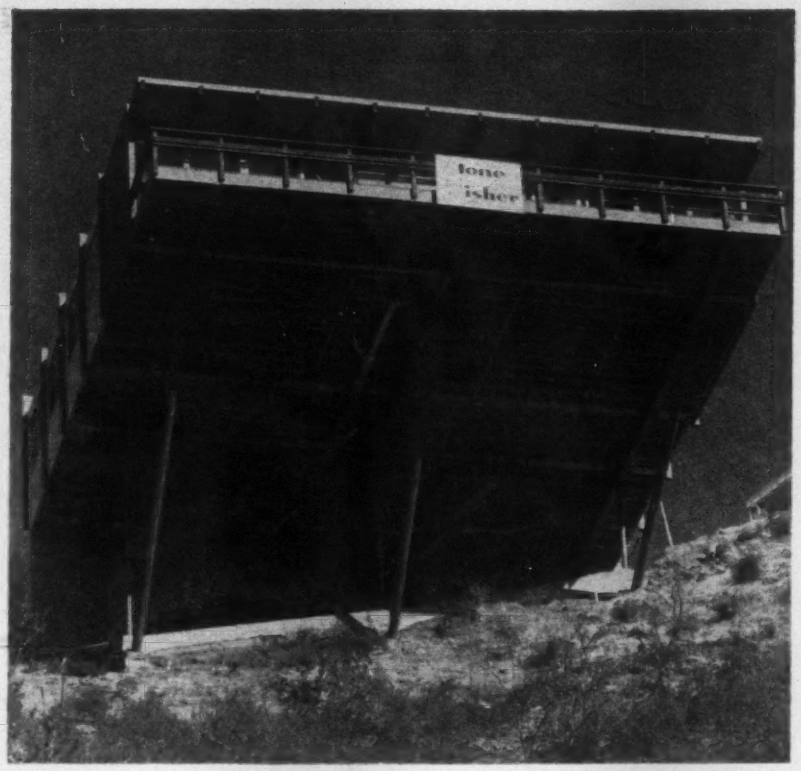
Three unusual houses in California have one thing in common—steel framing.

Two of them, constructed by widely different methods, are built on the side of steep hills. In one, structural steel frames floor, walls and roof. The other is a conventionally built house on a steel-framed platform cantilevered from the side of the hill.

The third is a steel-framed beach house with floor-to-roof glass walls overlooking the ocean.

• **Two-story frames**—Rigid steel frames solved two problems on a steep, wooded slope above Mill Valley. They permitted construction of a house without destroying the natural beauty of the location, and also the use of large glass walls for an uninterrupted view of the valley.

Six identical trapezoidal rooms comprise the house. They form an arc around a saddle in the hill. Framing consists of five twin-stemmed, T-shaped, two-story frames radiating from a common center. Concrete block shear walls at each end of the house will carry lateral loads. Accurate steel fabrication allowed fast erection without any field adjustments.



Steel-framed platform soars 45 ft out from hillside.

Cuts Homebuilding Costs

Thorne, of Berkeley, Calif., was the architect, with structural design by Jack Davis of Montgomery & Davis, El Cerrito, Calif.

• **Steel-framed platforms**—Faced with the soaring cost of flat land, a Los Angeles contractor built houses on steel-framed platforms over a low-cost steep hillside. By working from the platforms, he reduced wood framing costs by 40 cents per sq ft to equal the average level ground building cost.

The 2,000-sq-ft platforms, supported by vertical and sloping pipe columns, rise 40 ft above the hillside. Column footings are tied back to a concrete retaining wall at the high side of the slope.

Three 45-ft-long 16 WF 36 floor beams are anchored at one end in the retaining wall. They are supported by 4-in.-dia pipe columns near midspan, and 8-in. sloping pipe columns near the cantilevered end. Vertical and sloping columns are bolted to the same footing. All column-to-beam connections are welded.

William Sutherland Beckett and Associates designed the houses. The contractor was Stone-Fisher Constructors.

• **Beach house**—Steel framing cut $6,000 from the cost of conventional wood stud-wall construction on a twelve-sided home at Stinson Beach.

The steel frames enabled the architect to design a light, open structure with maintenance-free wall panels. The frame is emphasized by glass panels in the wall.

Steel-pipe columns with ridge and valley angles frame the folded-plate roof. Valley angles, formed from 12 ga, 6-in. steel strip, span 16 ft between 3½-in.-dia pipe columns. Ridge angles, similar to the valley angles, support 1⅛-in.-thick plywood roof panels.

The rigidity of the roof's diaphragm action eliminated additional bracing. Several severe storms have proved the structure's stability.

Walls facing an inner courtyard, and those overlooking the sea, are glass from floor to ceiling. Unpainted asbestos-cement panels, with clerestory windows, are used for doors and the remaining walls.

Architect for the beach home was Jock McKay of San Francisco. David Hammond of Palo Alto was the structural engineer and Bain Construction Co. of Larkspur the general contractor.

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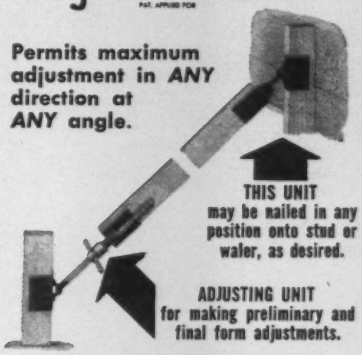
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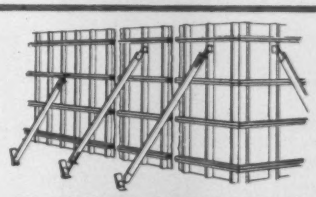

VARIOUS METHODS OF USING SUPERIOR ADJUSTA-BRACE

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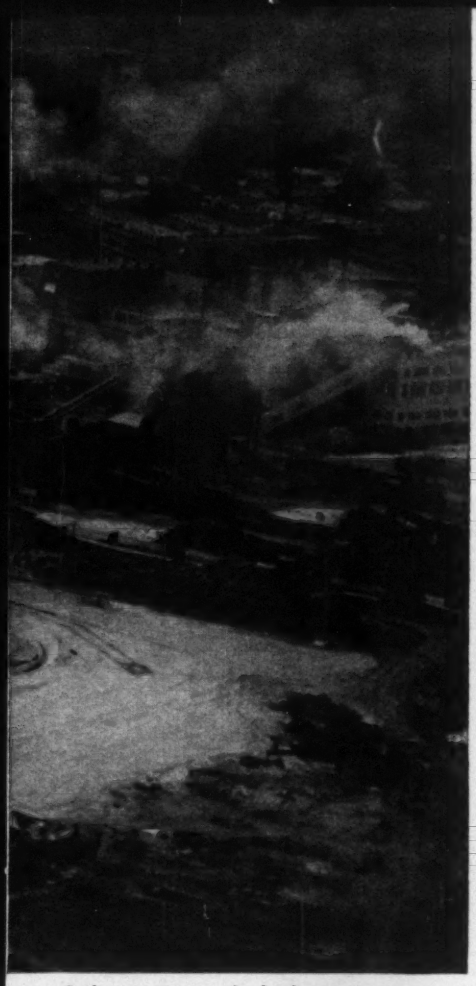
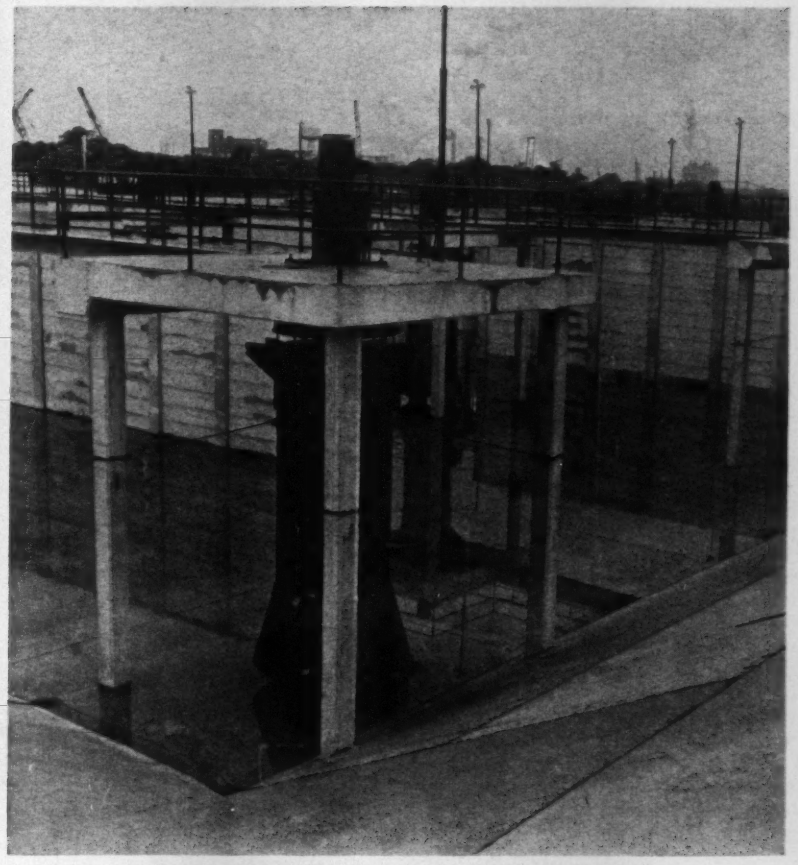
Waste treatment plant (center) goes to work at Mobile, Ala., paper mill as industry's newest and biggest

Big Activated Sludge Plant for

Primary sedimentation is carried out in a single 300-ft-dia, 9-million-gal settling basin.



of the activated sludge type.



Aeration tank is equipped with mechanical aerators.

Paper Mill

Industry's biggest waste-treatment plant of the activated-sludge type has gone into operation at Scott Paper Co.'s Southern Division mill in Mobile, Ala.

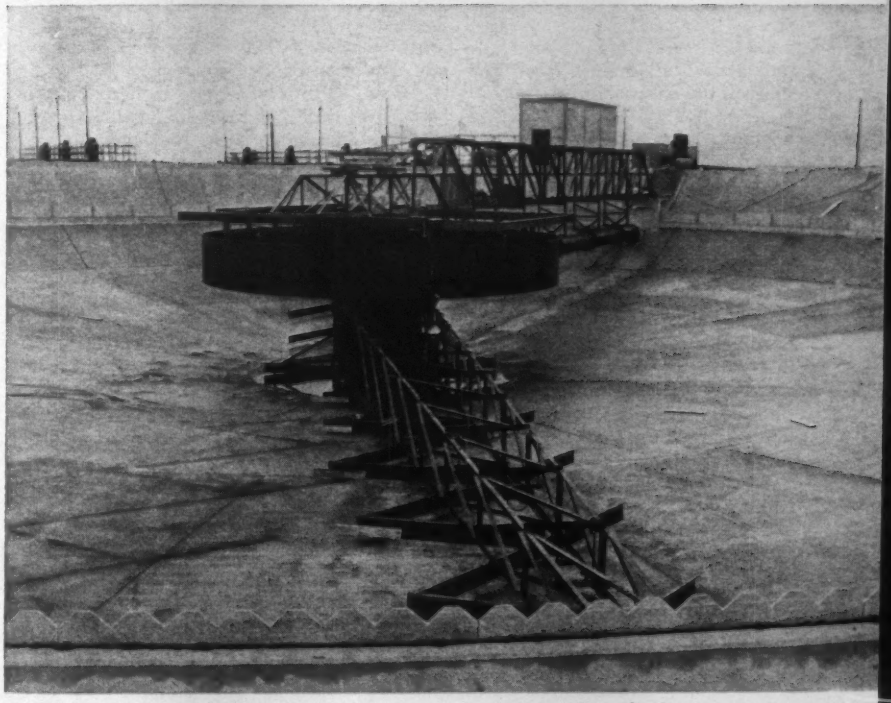
At full capacity it will give so-called complete treatment to 25 million gallons a day of kraft and tissue manufacturing wastes plus partial treatment to another 10 mgd.

The biggest plant of this type built heretofore for industry has a design capacity of 21 mgd. It handles wastes produced by the West Virginia Pulp and Paper Co. at Luke, Md., and three small Potomac River communities nearby (ENR Mar. 10, 1960, p. 28).

Major elements of the primary plant include a low-lift pumping station, a 300-ft diameter settling basin holding 9 million gallons, and a vacuum filter for dewatering the suspended solids and pulp fiber sludge removed by the clarifier.

The activated-sludge-type secondary plant consists of a 3.5-mg aeration basin, 165-ft wide by 275 ft long, equipped

(*Please turn the page*)



Final settling tank has 12-point suction system for sludge return.

with 12 motor-driven surface aerators; a final settling basin, 150-feet in diameter; a pumping station for recycling activated sludge; and storage and feeding facilities for nutrient chemicals.

The treatment is expected to improve water quality in the lower Mobile River. The Scott mill and a larger International Paper Co. mill are located a half mile from the river on Chickasaw Creek, which empties into the Mobile about seven miles upstream from the river's outlet to Mobile Bay.

• **Increased production**—The new waste plant is an outgrowth of Scott's rapid expansion of the mill since its acquisition by merger with the Hollingsworth & Whitney Co. in 1955, coupled with increasing awareness in both government and industry of the need for pollution control.

When Alabama passed its water pollution control law in 1950, the mill was producing 250 tons of kraft paper daily. At that time the mill received a permit from the Commission to discharge in its waste effluent a certain amount of suspended solids. No mention of BOD was made in this permit. After the merger, Scott increased its daily production by 350 tons (150 tons of Kraft and 200 tons of tissue) and received a renewal of the original permit.

At the time, the state authorities considered solids the only problem and believed the river could absorb the organic pollution. Then came a 1958 survey by the Alabama Water Improvement Commission that showed low oxygen conditions in the river. So Scott's proposed 1960-1961 expansion, to increase kraft pulp production by 300 tons a day, called for a more thorough study of the effects on the river.

• **More treatment**—Scott engineers, along with Hazen & Sawyer, a New York City consulting engineer firm, conducted a comprehensive study of river conditions and the effect of increased pulp and papermaking capacity on the mill's wastewater disposal system. The engineers recommended that the existing settling ponds be replaced with new primary treatment facilities and that an activated sludge plant be installed to hold the mill's organic pollution discharge within the daily limit now required by the Water Improvement Commission.

The engineers also recommended conservation and housekeeping improvements and advised Scott to arrange for regular sampling and analysis of the Mobile River above and below the mill. The data will enable the company to measure the effect of its operations on the river and to gage its share of the dilution water available.

Scott gave Hazen & Sawyer the job of designing the waste treatment plant,

SETTLING BASINS were scooped out and lined with river sand and 4 in. of concrete. Pile-supported foundations were installed for mechanical equipment.

awarded a site preparation contract to a New Orleans dredger, Wiliams-McWilliams, and awarded the general construction contract to Bernard & Byrd of Mobile.

The commission will measure pollution three ways: oxygen demand imposed on the river by the wastes; amount of suspended solids discharged to the river; and dissolved oxygen in the river water downstream from the mill.

Before treatment, Scott's daily waste outflow of 40 million gal is expected to contain 56,000 lb of BOD and 49,000 lb of suspended solids. After complete treatment, it will contain 25,000 lb of BOD and 14,700 lb of suspended solids when the treatment plant is operating at capacity. Both the before and after figures include an untreated 5 million gal of acid bleach wastes and its content of 6,000 lb of BOD and 2,000 lb of suspended solids.

The dissolved oxygen content of the river varies, and no one has investigated its relation to paper mill operations extensively enough to determine it accurately. Studies so far show that low flow and hot weather combine to make August and September the critical months. In the 1958 survey, the Water Improvement Commission found dissolved oxygen as low as 2.5 ppm (parts per million) at times during these two months.

The dissolved-oxygen level now determines Scott's waste-treatment requirements under the permit by the commission. When oxygen in the river is above a certain level, the mill can discharge up to 14,000 lb of suspended solids, a day and need not regulate the BOD discharge. When oxygen level drops below the mark, the mill must limit its BOD discharge to 25,000 lb a day. Practically, this means the mill must provide primary treatment all the time and secondary treatment about half the time. The engineers expect secondary treatment to be required from June through November.

The waste plant is built on the site of the abandoned settling ponds. Approximately 170,000 cubic yards of mill wastes and soft organic materials deposited by waste water in the past were dredged out and replaced by 270,000 cubic yards of river sand from the creek and the Mobile River.

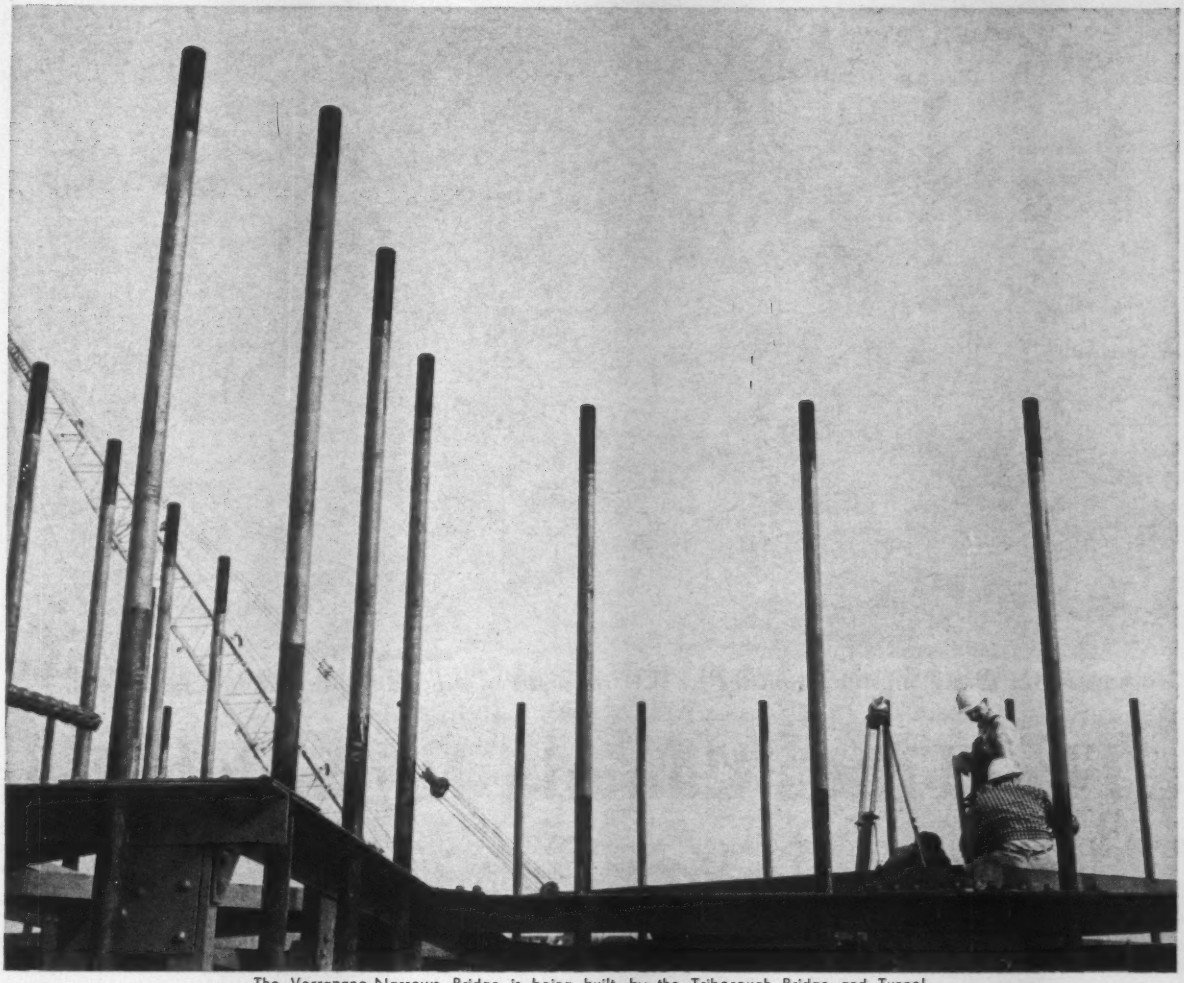
• **Low cost**—The new treatment works, including site preparation, intercepting sewers and engineering charges, cost $1.5 million dollars. This brought the unit cost quite low—to $60,000 per mgd of activated sludge plant capacity. Certain features of the design made this low cost possible:

• Structural costs were reduced by forming the two clarifiers and the aeration basin out of sand and lining them with 4 in. of concrete. The clarifier mechanisms are centrally supported on pile foundations. The aerators hang off concrete platforms supported by concrete piles.

• Mechanical aerators, dissolving oxygen from the atmosphere into the aeration basin, are used in place of compressors and diffusers. Each of the 12 mechanical aerators consists of a 40-hp motor, reducer, surface impeller and draft tube.

• Single large clarifiers were constructed for both primary and final settling. The primary clarifier (300-ft dia) is sized to treat the ultimate waste flow from the mill. The final clarifier (150-ft dia) is sized for 25 mgd. Deterioration of final sludge is minimized by a suction pick-up mechanism that collects activated sludge at twelve points. The resulting quick sludge return offsets the disadvantages of having one large clarifier.

Hazen & Sawyer were retained by Scott's Staff Engineering Division, of which R. G. Young is manager. J. W. McNichol is manager of the Mobile mill. Frank P. Coughlan, associate in Hazen & Sawyer, directed the project for his firm.



The Verrazano-Narrows Bridge is being built by the Triborough Bridge and Tunnel Authority. Consulting engineers are Ammann & Whitney. Sub-contractors: Steers-Snare

ANCHOR BOLTS *for Verrazano-Narrows Bridge*

Fifty-four anchor bolts have gone into each of the two 37-ton anchor bolt frames; which will secure the 630-ft-high Staten Island Tower of New York's Verrazano-Narrows Bridge to its massive concrete pier. The 3-in.-diameter bolts are 21 ft, 9 in. long. After the frames are positioned, they will be embedded in the pedestals for support of the tower legs. The anchor bolts provide the necessary resistance to uplift which occurs, at the base, during the bridge construction phase.

Specially manufactured at Bethlehem's Lebanon, Pa., fastener plant, these king-size bolts required exacting tolerances, since all future work on the huge tower is dependent upon close fit, as well as precise location of the bolts and their connections within the tower base section.

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Grading crews apply finishing touches to TCH roadbed in rugged Banff National Park.

The Trans-Canada Highway Nears

By G. B. Williams

The entire Trans-Canada Highway, from St. John's, Nfld., to Victoria, B.C. –a distance of almost 5,000 miles–will be open to traffic this year, if construction goes as scheduled.

This highway spans a continent and stretches almost one-fifth of the circumference of the globe. To date, more than $1 billion and 10 years of labor have gone into it.

Building the Trans-Canada Highway has meant forcing a road through mountains, forests, marshes and prairies –clearing thousands of acres of right-of-way, bridging cataracts, blasting away mountain sides and fending off avalanches (ENR Apr. 16, 1959, p. 38).

Three major accomplishments in the past year have brought the highway near to completion:

- Participation of the Province of Quebec in the highway plan.
- Construction of a rugged, 165-mile stretch of road northeast of Lake Superior.
- Progress in the difficult Rocky Mountain section.

When the original Trans-Canada Highway Act was passed in 1949, all Canadian provinces except Quebec signed agreements with the Dominion government to take part in the project. Most Canadians always considered that the Trans-Canada system was not really complete because of this.

Last year Quebec signed an agreement with the Dominion Government to join in the system. This adds some 400 miles to the length of the highway, most of it over existing first class roads. Considerable construction work is nevertheless expected to be done, especially in the Montreal area, before the expiration of the Act in 1963.

Opening of the northern Ontario section to traffic recently marked the completion of one of the most difficult sections of the highway, the 165-mile gap between Agawa and Marathon on the northeast shore of Lake Superior. This area is studded with tumbling granite peaks and rivers racing at the bottoms of rugged canyons.

Survey crews had to travel to their sites by plane or boat, for lack of other access. Construction teams had to clear 1,723 acres of virgin forest from the right-of-way and build 25 bridges over foaming rivers. In one five-mile section near Agawa, 2 million tons of granite had to be moved.

It cost $40 million to bridge the 165-mile gap, but the section surpasses Trans-Canada Highway specifications laid down by the Federal Department of Public Works. These call for a minimum right-of-way of 100 ft, grades of 7% and maximum curvature of six deg. The new road has a right-of-way of 150 ft, its maximum curvature is five deg and the hill sections of the route have been flattened until there is only one grade that reaches 7%.

It is one of the most important sectors of the Trans-Canada, because it opens up for the first time a new direct first-class route between Eastern and Western Canada along the north shore of Lake Superior. Previously much traffic went south of the Lakes via the United States. This section is economically important because it passes through a large, but relatively undeveloped vacationland.

Although the Rocky Mountain section isn't yet all open to traffic, construction progress has been impressive. All bridges are in place, grading is complete and the avalanche defenses, probably the world's most modern, are taking shape.

The final gap is a 90-mile stretch between the towns of Golden and Revelstoke, B.C., in the heart of the Rockies. Nowhere along the entire route have so many challenges appeared in such a short distance as within the boundaries of Glacier National Park. The road traverses 3,600-ft-high Rogers Pass, which construction men call one of the most difficult mountain areas on the

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*Author **Williams** is Assistant Deputy Minister of Canada's Department of Public Works. He has played a key role in construction of the Trans-Canada Highway.*

Paver spreads asphaltic mixture in the shadow of Mt. Eisenhower, Alberta province.

Completion

continent. The engineers faced almost every type of road-building problem plus a high avalanche potential.

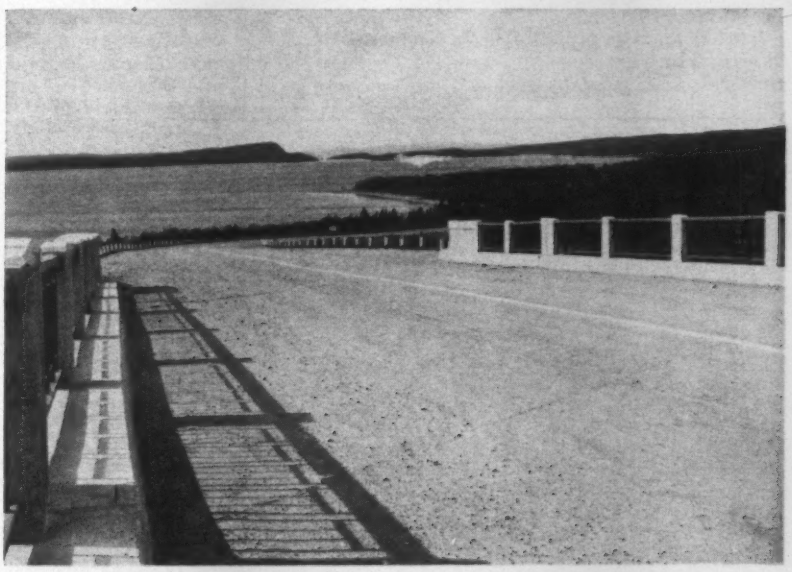
Overall cost of construction of 27.3 miles of road through Glacier Park was $21 million. Before construction even began, the builders had to clear 734 acres of scrub and brush. By the time they finished the project they had removed 5.6 million cu yd of earth and 3.5 million cu yd of stone.

Drainage in mountain areas presents peculiar problems. In Glacier National Park almost a mile of fluming and more than two miles of under-drain pipes were required. Culverts are so numerous that if all the culvert pipes used were placed end to end they would stretch for nearly five miles.

In addition to the unusually large number of culverts, seven bridges and a railway overpass with a total combined length of 1,500 ft are being built while a tunnel 600 ft long, 19 ft wide and 16 ft high diverts the waters of Bear Creek. Materials used in building the bridges and lining the tunnel include 9,900 lin ft of timber piling, 13,245 lin ft of steel piling, 8,000 cu yds of concrete, 450 tons of reinforcing steel and 1,000 tons of structural steel. Over 35,000 sq ft of retaining walls are under construction along the right-of-way.

(Please turn the page for a description of avalanche defenses on the Trans-Canada in Glacier National Park.)

East-west highway extends 5,000 miles to span the continent.



Newly opened section skirts northeast shore of Lake Superior.

Towering peaks of the Canadian Rockies make the Rogers Pass area avalanche prone.

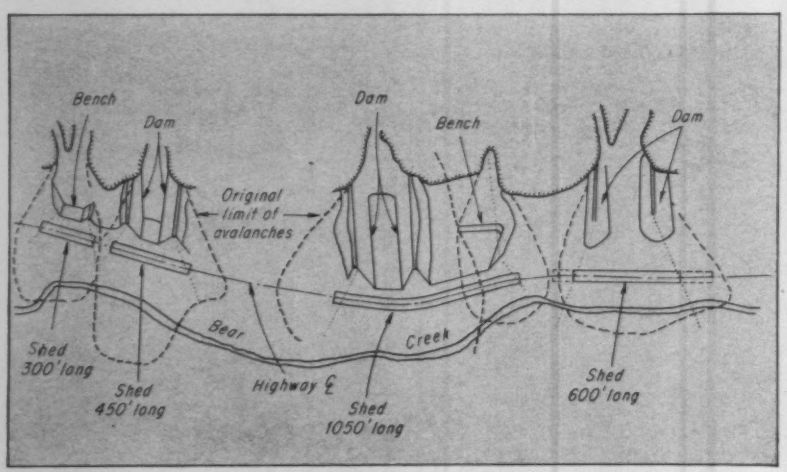
Elaborate Road Defenses Thwart

The Rogers Pass section of the Trans-Canada Highway (see map on preceding page) threads its way through one of the most active avalanche areas in North America. Snowfalls here average 390 in. per year, with the record high being 600 in. in a single season.

In an attempt to keep the road open all year, Canadian engineers designed snow defenses in depth. Included are systems of earth mounds, benches and dams to break up and divert road-blocking avalanches, plus 2,700 ft of steel-and-concrete snow sheds. Cost of these structures will be about $3.5 million.

• **Mounds and dams**—Earth mounds used to defend against avalanches resemble the anti-tank defenses built in some areas in World War II. They are rounded pyramids from 15 to 22 ft high, 60 to 75 ft in diameter at the base, spaced from 80 to 100 ft center-to-center. They are placed in known avalanche paths, on slopes above the road. Avalanches break up when they hit the mounds.

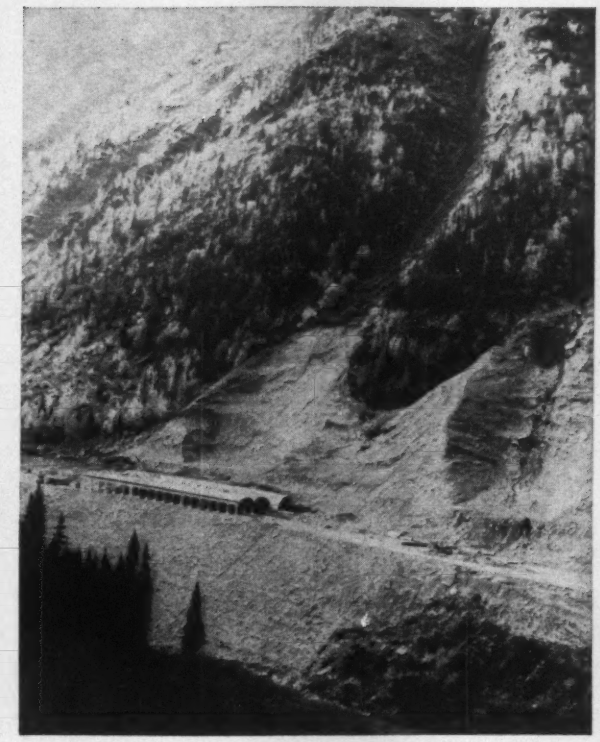
Earth dams stand at the sides of known avalanche paths to contain slides and force them to pass over the road on snow sheds (see sketch). Dams vary in size, are typically 25 ft high and several hundred feet long. They—and benches used with them in some locations—also serve to absorb some of the slide's impact and brake the avalanche.



DAMS, benches and sheds protect 0.6-mile long section with 8 major avalanche sites.

• **Concrete snow sheds**—The reinforced concrete snow sheds cover a four-lane divided highway. Longitudinal supports for precast and prestressed roof beams include two lines of reinforced concrete piers on spread footings and a gravity-type retaining wall on the side of the road facing the avalanche slopes (see sketch).

The contractor waterproofs the upslope side of the retaining wall and casts the concrete deck in place over the roof beams. A 36-in.-dia perforated pipe drains the permeable backfill behind the wall. The fill extends over the



Corrugated metal and concrete snowsheds . . .

protect four-lane Trans-Canada Highway.

Avalanches

top of the shed, feathering to zero depth at the outside (down-slope) edge of the shed roof.

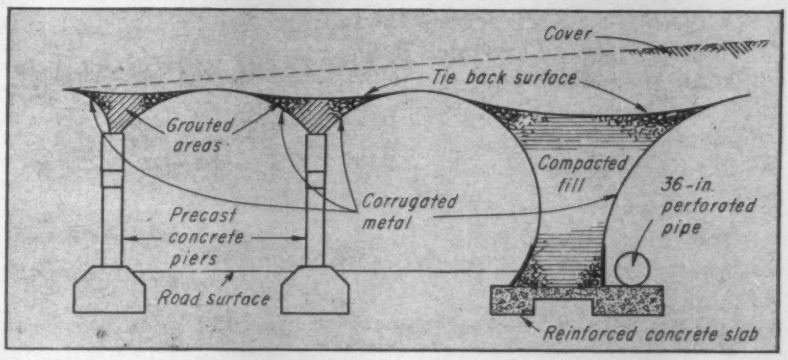
Engineers designed the sheds for a snow load as high as 1,100 lb per sq ft. In addition, they will carry a sliding force of snow equal to 20% of the vertical load.

The down-slope side of each shed is left open, except in locations where slides from the opposite side of the valley might endanger the road.

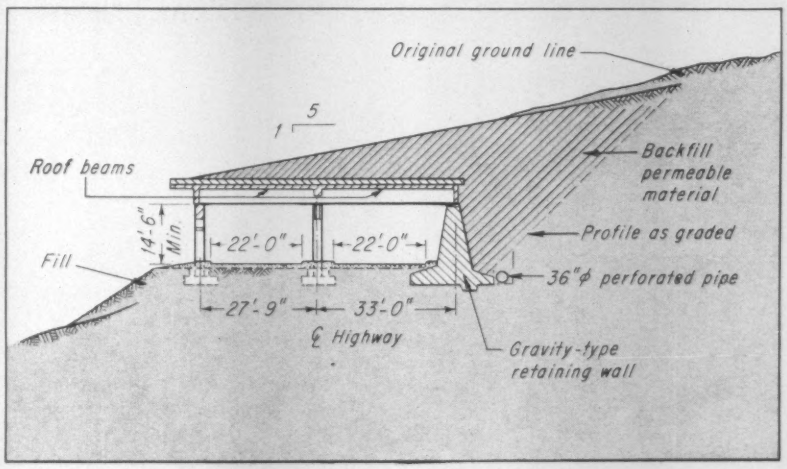
• **Corrugated metal snow sheds**—Another type of snow shed incorporates three sections of Armco field-riveted, multiple-plate, corrugated metal pipe to form the shed roof and to replace the gravity-type retaining wall (see sketch).

In basic concept, this structure is in the form of a filled basket and two T-shaped sections, all tied together by flat plate ties across the top. It relies on composite action between corrugated metal surfaces and compacted earth.

During the winter of 1960-61, a structure of this type withstood a "50-year avalanche," although it had not been completed at that time. Backfilling had not been finished, but ties had been installed to hold the structure together.



MULTIPLE-PLATE corrugated metal pipe sections form shed roof and wall.



CONCRETE SHED has prestressed beams to hold up cast-in-place roof.

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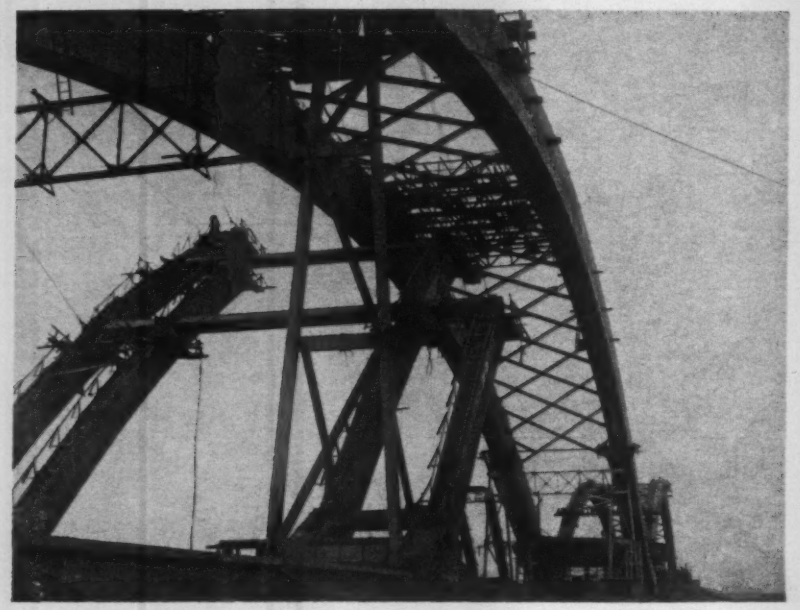


Concrete Arches Cross Danube

Removal of falsework (see picture) brings Mostogradnja, Yugoslav bridge-building enterprise, near completion of a double-arch railroad and highway bridge over the Danube River at Novi-Sad, which is located 47 miles upriver from Belgrade.

The bridge, part prestressed concrete and part cast in place, will be part of a Stockholm-Istanbul rail route. One arch has a span of 692 ft and the other 543 ft.

The river's heavy navigational traffic could not be held up, so the builders used four parallel prefabricated concrete arches as falsework on which to build the main span. This left a channel 342 ft wide.

Branko Zeselj designed the 65-ft-wide bridge.

30-Story Tower Is Britain's Tallest

Steel erectors have topped out Britain's tallest building, a 30-story tower in Manchester.

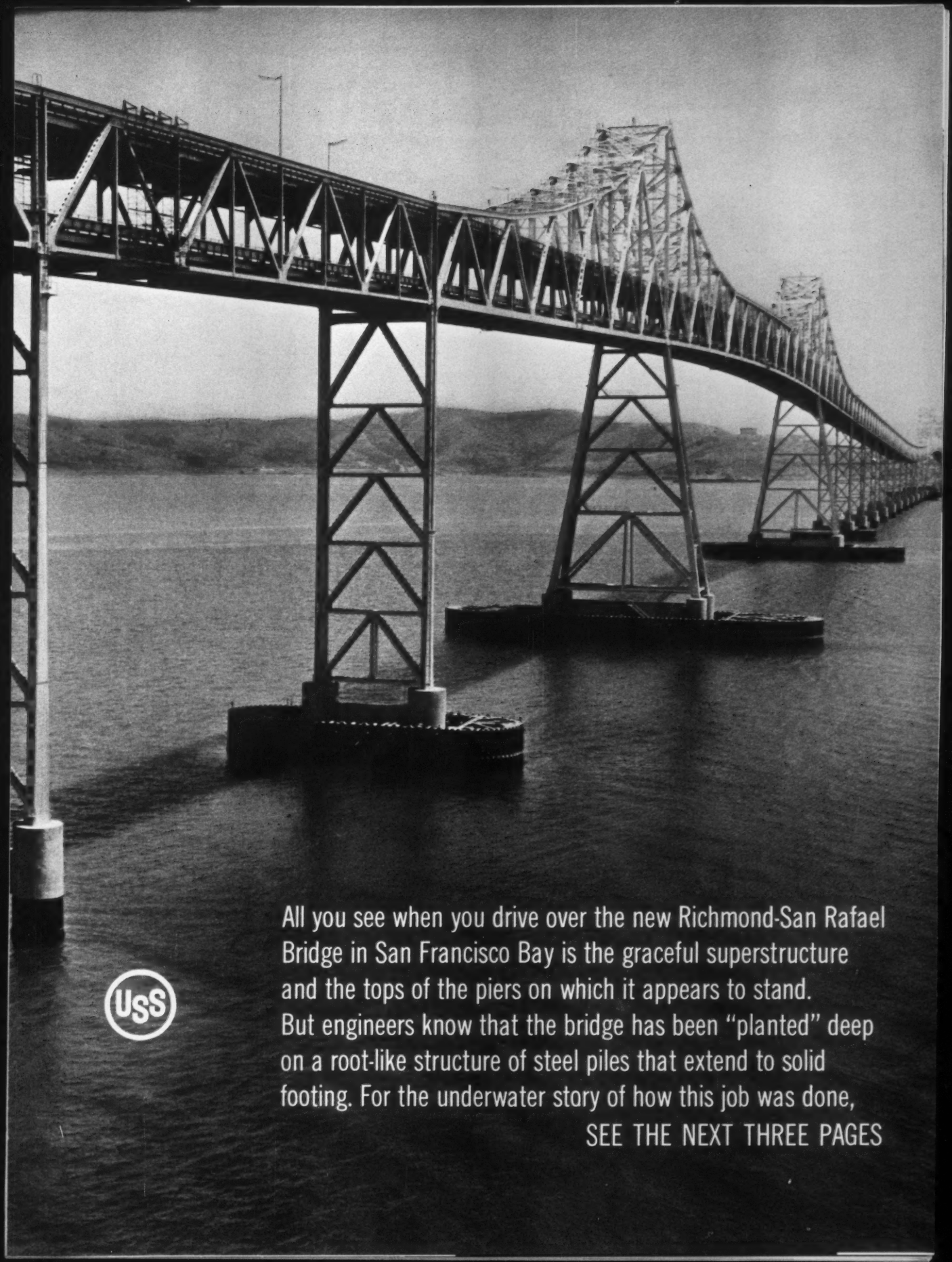
The tower, owned by Co-operative Insurance Building Society, Ltd., rises 400 ft, topping London's new, 34-story Vickers building by 15 ft (ENR May 19, 1960, p. 80).

A 456-ft tower crane, reported to be the tallest in Europe, played the workhorse role in construction of the building. It hoisted materials and aided in steel erection, assembling and dismantling derricks as the framework rose.

The slender office tower, 137x59-ft in plan, rises out of a five-story base building over a three-level basement.

The building's walls are insulated steel sandwich panels faced with black vitreous enamel. Tower floor framing consists of precast concrete joists with cast-in-place concrete deck.

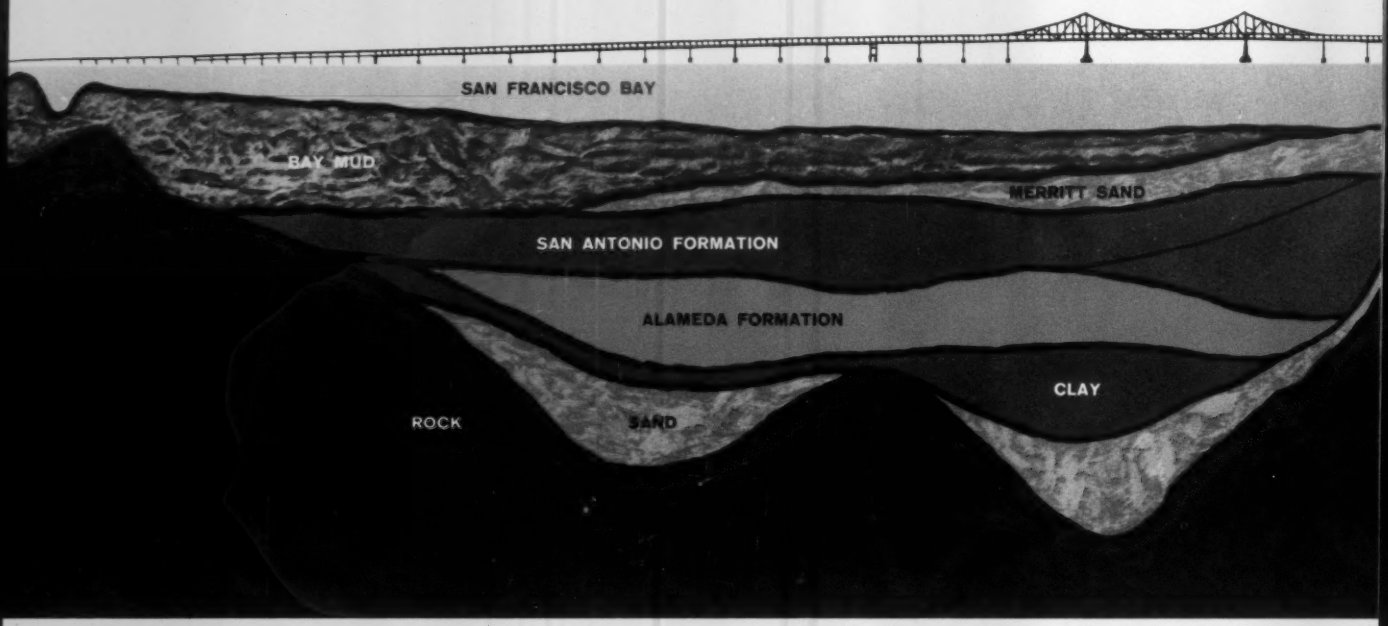
Architects are G. S. Hay, chief architect of the Co-operative Wholesale Society, Ltd., and Sir John Burnet, Tait and Partners. The structural engineer is A. E. Beer. John Laing Construction Ltd., is the general contractor. All are from London.



All you see when you drive over the new Richmond-San Rafael Bridge in San Francisco Bay is the graceful superstructure and the tops of the piers on which it appears to stand. But engineers know that the bridge has been "planted" deep on a root-like structure of steel piles that extend to solid footing. For the underwater story of how this job was done,

SEE THE NEXT THREE PAGES

Richmond-San Rafael Bridge over San Francisco Bay—length 21,345 feet. Lower sketch shows stratification encountered and points up need for extra long piles. This bridge was built for the State of California, Department of Public Works, Division of San Francisco Bay Toll Crossings. Substructure General Contractor: Ben C. Gerwick, Inc., and Peter Kiewit Sons Company.



Problem: How to put the Richmond-Solution: USS H-Piles under novel

The Richmond-San Rafael Bridge, just north of San Francisco, is one of the world's longest. It stretches across the bay for 21,345 feet. This makes it longer than the Mackinac Bridge and only 1,377 feet shorter than the San Francisco-Oakland Bay Bridge. The new bridge has two decks, each carrying three lanes of traffic across San Francisco Bay between Richmond and San Rafael, California.

Tests on soil samples indicated proposed loads on displacement-type piles would probably result in excessive settlement. It was decided that piles had to be driven to rock or into a deep sand-gravel stratum.

Studies indicated that steel H-piles were the logical choice because:

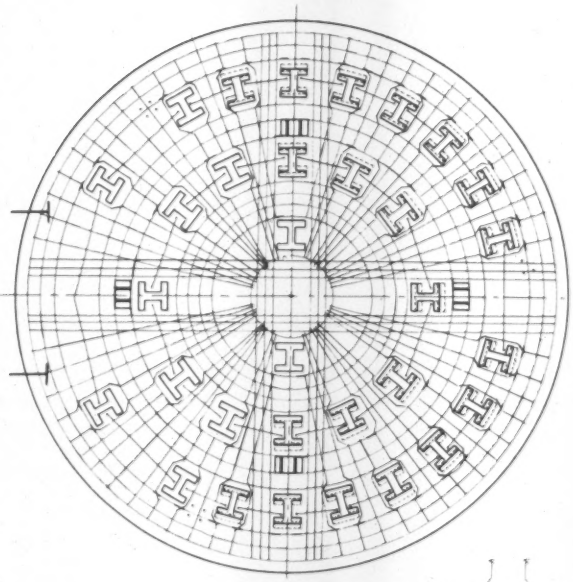
1. H-piles were more suitable for penetrating the deep overburden in order to reach suitable strata for end bearing.
2. H-piles provided utmost flexibility of final lengths—they could be easily cut or spliced.
3. Their ruggedness made for easy handling.
4. Their strength permitted heavy loads per pile.
5. They were readily available.

Precast bell-type piers were selected for the deep water portion of the job. These had proved economical for pile-supported piers in moderately deep water on previous major bridge jobs. At each bell-pier location, several steel H-piles were driven to position a precast concrete base grid which was later incorporated in the pier foundation. The base grid contained slots designed to act as guides for the remaining 14-inch, 89-pound steel H-piles. These were later grouted into the base grid which then served as the base for the precast bell sections set on top. After pouring a tremie seal inside the bells, the rest of the concrete was placed in the dry. These base grids were 12 to 56 feet below water so that the contractor had to provide for underwater driving of piles. This was done with rigs especially designed for the job to provide telescoping leads to support the hammer as deep as 56 feet under water and the pile head as much as 110 feet above the water.

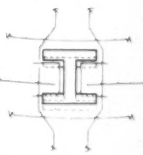
There were 62 bell-type piers constructed. In addition, 8 cofferdam-type piers and 9 dry-land piers also utilized steel H-piles. The 79 piers are supported by 5,047 14-inch, 89-pound steel H-piles ranging in length from 30 to 175 feet—a total of 585,700 lineal feet, or about 25,000 tons, approximately half of which were supplied by United States Steel.

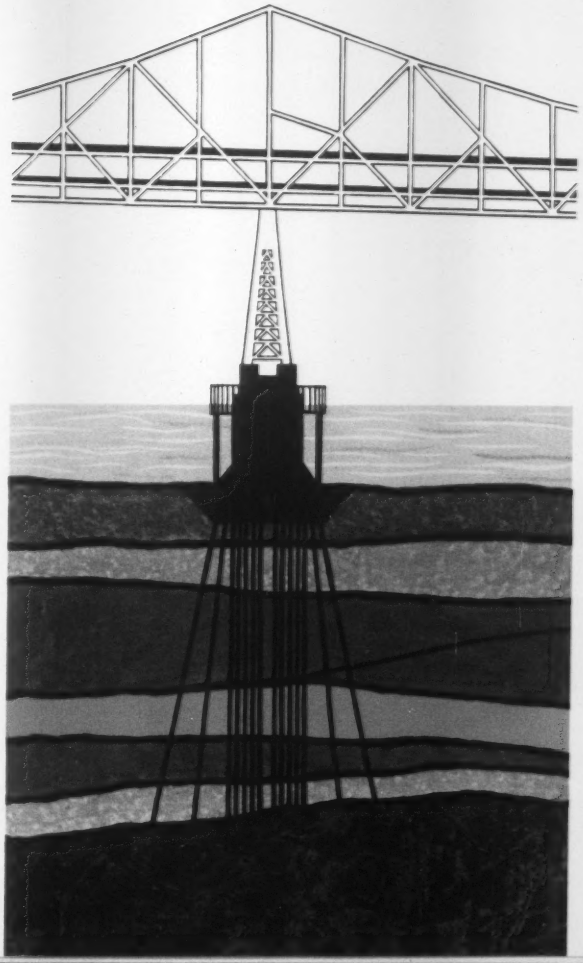
For information on any type of steel piling—steel H-piles, sheet piling or steel pipe piling, write to any of our district offices or United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

San Rafael Bridge across these holes... bell-type piers

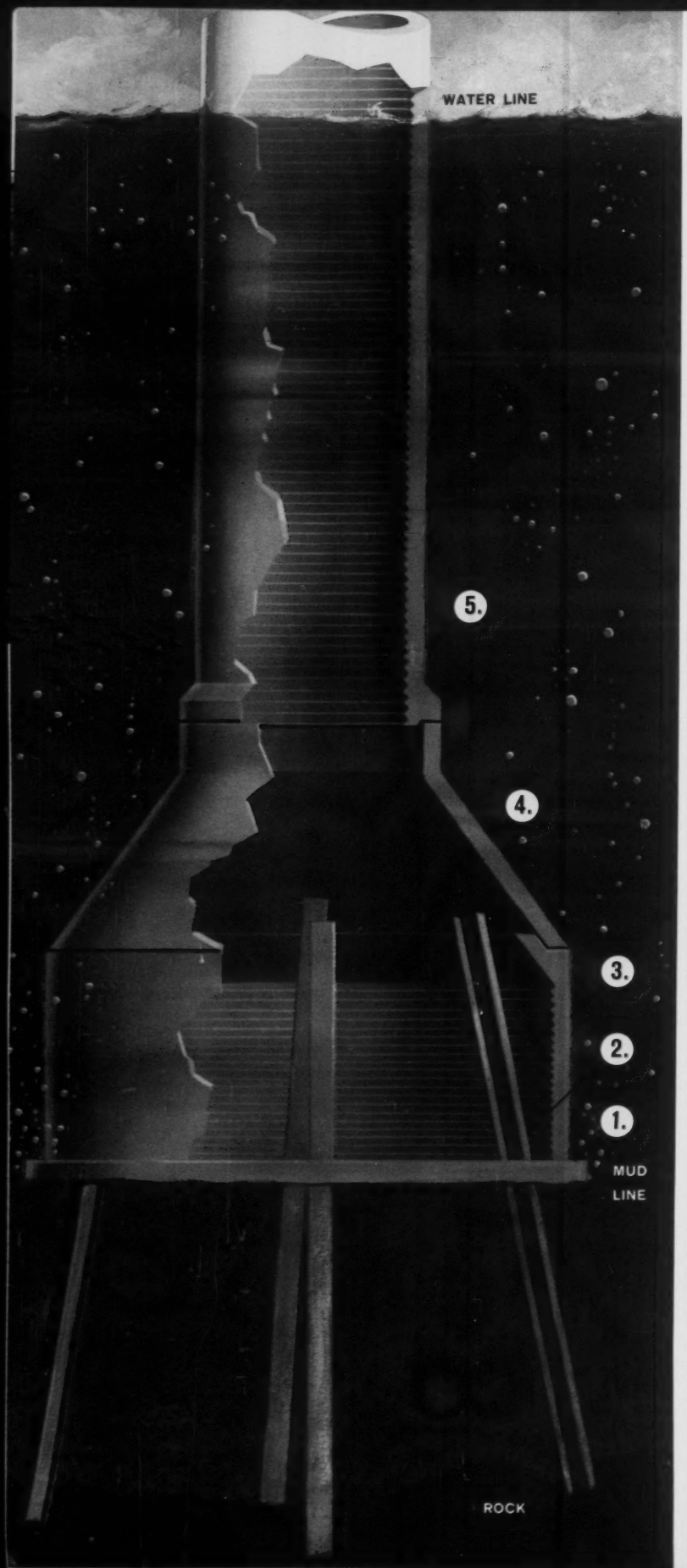


Base grid for bell-type pier showing slots for locating piling. Batter piles indicated by dotted lines and shown in detail on small drawing.





TURN PAGE



how the bell-type piers were constructed underwater

1. At each pier location, concrete base grids containing slots to guide the steel H-piles were lowered through the water to exact position. Some were as deep as 56 feet.

2. Several steel H-piles were driven to hold each base grid in exact position. The remaining piles were then driven and the base grids were later incorporated in the pier foundation. Where necessary, pile tops were cut off underwater by divers.

3. Cylindrical precast bell sections were lowered through the water and positioned on top of each base grid. A special seal made the joints watertight.

4. Cone-shaped precast concrete or steel sections with a seal on top and bottom were then placed on top of the cylindrical sections.

5. Precast shaft extending above water. After pouring a tremie concrete seal inside the bells, the rest of the concrete was placed in the dry.

For the main piers using four interconnected bells and for some of the two-bell piers, special steel forms were used instead of precast concrete bells.

USS is a registered trademark

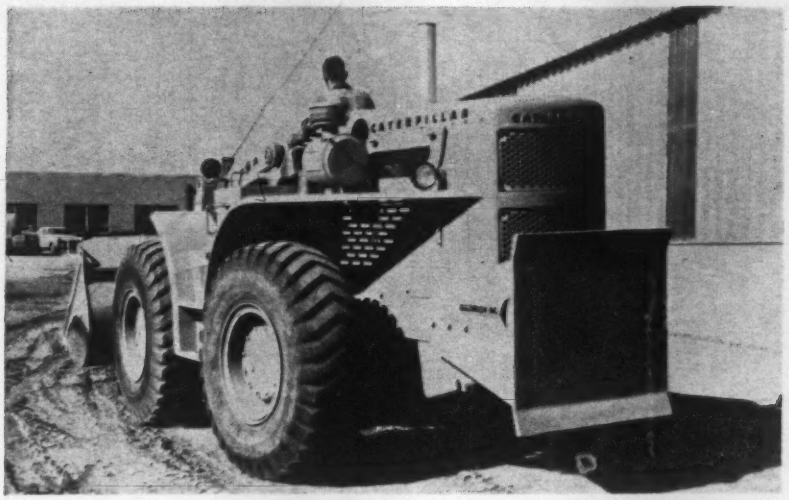
United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
National Tube – Pittsburgh
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company
United States Steel

USS

Steel

because it's strong
because it's durable

New Products

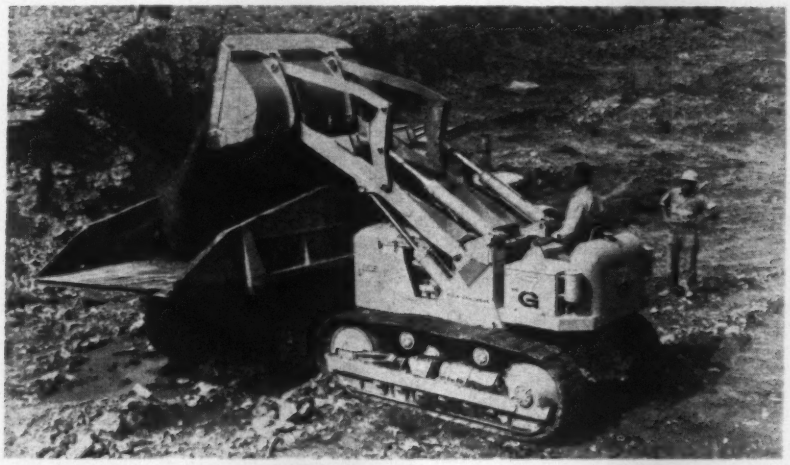


Cat Attachment Has Dual Purpose

Push Plates BP 966, 944 and 922, are attachments that act as both pushers and counterweights for Caterpillar wheel loaders of corresponding numbers.

The plate pushes scrapers, loaders, trucks and other equipment, and serves as a counterweight during loading operations.

Traction is added by the weight of a Push Plate when dozing or plowing snow, according to the manufacturer. BALDERSON INC., WAMEGO, KAN.



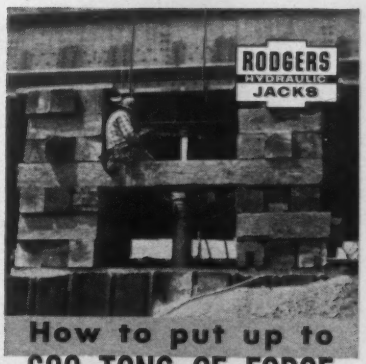
Shovel Features Power Operation

The HD-7G tractor shovel, with a 1¾ cu yd bucket capacity, has hydraulic power steering, oil-cooled power brakes, single lever power shift transmission.

The Allis-Chalmers "Ground Speed Control" governor features a steady working travel speed, with or without a load. The tractor shovel does not slow down when the load is increased and it does not surge ahead when the load is lightened.

The HD-7G, with a 100-hp, turbo-charged diesel engine, has working speeds up to 5.9 mph forward and 4.2 mph in reverse.

Front attachments include a heavy-duty rock bucket, lift forks, crane hooks, straight and angling dozer blades and a pulp-wood loader. Rear attachments are a hydraulic ripper and a backhoe. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.



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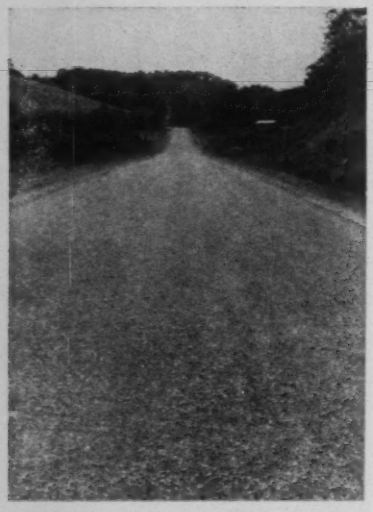
561 S. PRINCE STREET LANCASTER, PA.

Mixing and placing a Cationic Bitumuls "mat" with a Moto-Paver. Note how closely the roller follows the paver.



This is a completed Cationic Bitumuls Drag Seal Job.

North Carolina forces apply cover aggregate to a Cationic Bitumuls Split Seal on 8.1 miles of State Highway.

CATIONIC BITUMULS NOW USED BY 21 STATE HIGHWAY DEPARTMENTS

Here's why:

1. **Fast Initial Set even in adverse weather.**
2. **Better Adhesion even with "hard-to-coat" stone.**
3. **"Rain-Proof" Coating of Aggregate (resists wash-off in sudden showers.)**

Since 1958, when we first introduced Cationic Bitumuls, it has gained steadily in acceptance by State Highway Engineering Departments all across the nation. Now, in twenty-one of our fifty states this material is in actual use. It is being tested and evaluated by many more.

Here's how one State took to Cationics

In 1958, The State Highway Commission of North Carolina took delivery of 100,000 gallons of Cationic Bitumuls so that one of their fourteen Divisions could do experimental work. When the results were evaluated here's what they found:

1. Early rains didn't damage the work.
2. The roads could be opened to traffic sooner.
3. The surfaces held more cover stone.

Based on these performance reports, the Commission made Cationic material available to all fourteen Divisions. In 1959, they used a total of 4,000,000 gallons. Last year (1960) 8,500,000 gallons!

How Cationic Bitumuls is used in North Carolina

North Carolina uses Cationic Bitumuls for two basic types of work: Split Seal, Drag Seal (Double Surface Treatments), Single Seal, Triple Surface Treatments; and Moto-Paver Mixes. Aggregates used vary from one area to another but the principal ones are gravel, granite, slate and limestone. Cationic Bitumuls performs uniformly well with all of these.

Cities, too, adopt Cationics

Many cities in North Carolina have switched to Cationic Bitumuls for much of their street and road work, profiting by the experience of the State Commission.

This same process is going on all across the country as more and more engineers become familiar with the high-level performance of Cationic Bitumuls.

If you have not had an opportunity to check a Cationic Bitumuls job in person, call our nearest office. A Bitumuls Engineer will arrange for you to visit a job near you.

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Atlanta 8, Ga.
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Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

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Diversion of Missouri at South Dakota Dam

Contract for construction of this rolled earth embankment 8,000 ft long, 80 ft high and excavation of approach and discharge channels for the powerhouse and spillway at Big Bend Dam, Ft. Thompson, S. D., for the U. S. Corps of Engineers, Omaha, Neb., went to Western Contracting, Sioux City, Iowa at $5.5 million.

Western's bid was 8% under a joint venture of Guy H. James Construction Co., Oklahoma City, Okla., and J. H. Beckman, Sioux Falls, S. D., and 43% under the high of three.

Excavation of chalk, shale, pervious and random materials accounts for 68% of total cost, common excavation, 7,450,000 cu yd at $0.32 a yd, bids ranging from $0.27 to $0.46 a yd and 3,246,000 cu yd of chalk at $0.43 a yd which ranged from $0.43 to $0.83.

This job involves closure and diversion of the Missouri through the powerhouse and requires detailed construction planning and equipment utilization.

Basic wage rates include: skilled, $3.65/hr; semi-skilled, $2.10/hr; common, $1.80/hr.

The bidding included:

1C Western Contr. Corp Sioux City, Io $5,545,552
2 Guy H. James Const. Co. Okla. City, Okla. J. H. Beckman Const. Co. Sioux Falls, S. D. (Joint Venture) 6,050,000
Morrison-Knudsen Co. Inc. Seattle, Wash... 9,672,146
EE U. S. Corps of Engineers

Bids: 9-21-61 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, common	cy	7,450,000	$0.32	$0.27
chalk	cy	3,246,000	0.43	0.47
Water, care	ls	job	508,000	708,533
Grade & shape pervious borrow area	ls	job	6,000	2,000
Fill, impervious & semi-imperv	cy	1,500,300	0.07	0.10
pervious core drain, core drain outlet & pervious crest layer	cy	572,700	0.07	0.10
random & downstream berm	cy	2,469,100	0.07	0.10
Upstream berm & shale blanket	cy	2,516,400	0.07	0.10
Bedding material	cy	22,500	1.65	3.00
Spalls	cy	21,500	5.65	9.00
Riprap, tp A	cy	1,500	5.85	9.00
tp B	cy	42,000	5.85	9.00
tp C&E	cy	33,400	5.85	9.00
tp D	cy	2,000	5.85	9.00
Base course stabilized aggr	t	17,980	1.50	2.00
Guide posts	ea	100	3.00	4.00
Pipe, culvert 15"	lf	42	5.00	5.00
18"	lf	88	6.00	6.00
21"	lf	124	7.00	8.00
24"	lf	1,670	9.00	9.00
30"	lf	1,454	11.00	13.00
42"	lf	600	18.50	23.00
End section flared 24"	ea	1	42.00	65.00
42"	ea	2	200.00	250.00
Manhole	ea	2	400.00	500.00
Catch basin 24"	ea	19	200.00	150.00
30"	ea	6	215.00	200.00
Gages, settlement	ea	3	300.00	200.00
pipe	lf	980	10.00	8.00
Seeding	acre	85	140.00	200.00
Topsoiling	sy	418,000	0.09	0.02

ENR Constr. Cost Index (1913=100) 20-cities avg.—854.01

Highway Bridge Spans Cannonsville Reservoir

New York City's Board of Water Supply pulled nine close bids for the 7-span Cannonsville Bridge in Tompkins, N.Y. The award went to Walsh Construction Co., New York City, for $2,110,967, a bare 0.6% under the Lane Construction Corp., Meriden, Conn., and 17% below the high.

Concrete masonry is the top cost item, accounting for 21% of the low bid and includes 8,000 cu yd of material. Prices run from Walsh's low of $55.06 to a high of $79.00 a yd.

Steel is the second major cost item. Structural steel bit off 19% of the projects cost, and high strength structural steel ran away with an additional 16%. Prices for structural steel range from $0.2091 to $0.245 a unit for 1,900,000 lb, and bids for high strength move from a low unit price of $0.2146 to a high of $0.25 for 1,550,000 lb.

The superstructure will be supported by six piers and two abutments of reinforced concrete partially faced with granite. Piers and abutments will be founded on cast-in-place concrete piles.

The bridge will measure 1,200 ft between abutment bearings. Seven structural steel girder spans and reinforced concrete deck will carry a two-lane highway over the Cannonsville reservoir.

About 360 ft of adjoining highway on the south side of the bridge and another 400 ft on the north side, are also included in this contract. Both access roads and the bridge roadway will be paved with asphalt concrete.

Wage rates applicable to the contract include: carpenters, $3.73/hr; bulldozer operators, $4.13; steel erection derrick operators, $5.10; ironworkers, $3.95; and laborers, $2.95/hr.

The bidding included:

1C Walsh Const. Co., New York, N. Y. $2,110,969
2 The Lane Const. Corp., Meriden, Conn 2,123,525
9 Cayuga Const. Corp., New York, N. Y. 2,539,220

Bids: 8-29-61 Items	Unit	Quantity	Unit Prices 1C	2
Excavation	cy	8,000	$1.17	$4.35
Refilling & embanking	cy	20,000	1.20	1.05
Embanking, rock	cy	4,100	3.90	4.00
Foundation, course	cy	1,100	9.00	4.00
Fine grade, prepare	sy	2,800	0.25	0.25
Asph concrete	t	1,200	14.00	15.00
Shoulders, stab gravel	cy	65	22.00	23.00
Dressing & grassing, surf	cy	1,200	5.00	4.00
Timber & Lumber	Mfbm	5	445.00	500.00
Concrete, masonry	cy	8,000	55.06	62.00
piles, cip	lf	12,500	9.00	10.00
Resin coating, fiber glass reinf	sf	34,000	0.80	1.50
Dry rubble, paving	cy	6,000	10.64	17.00
Facing, granite	cy	460	465.00	375.00
Portland cement	bbl	14,000	5.43	5.00
Bank gravel, run	cy	125	4.00	4.00
Steel, for reinf concrete	lb	750,000	0.11	0.14
str	lb	1,900,000	0.2091	0.215
high strength	lb	1,550,000	0.2191	0.215
Covering, prot for met surf.	sf	85,000	0.30	0.30
Met work, misc	lb	185,000	0.33	0.40
Railing, beam type	lf	2,060	2.65	3.00
Steam control	ls	job	120,665	42,000
Cleaning up	ls	job	58,055	8,000

Completion time: 18 months

ENR Constr. Cost Index (1913=100) 20-cities avg.-854.09
ENR Building Cost Index (1913=100) 20-cities avg.-570.86

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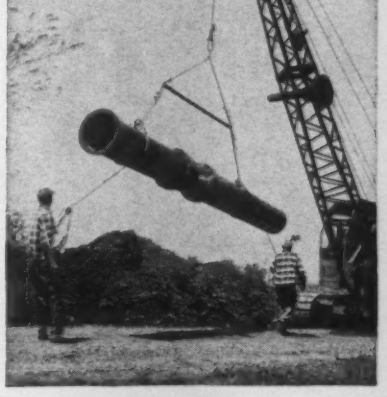

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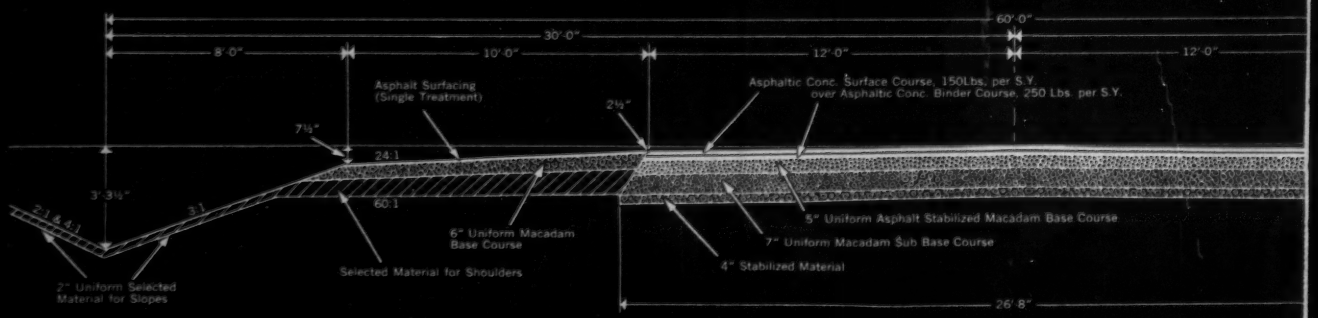
CLOW CAST IRON PIPE

New DEEP STRENGTH Asphalt Section of South Carolina Interstate No. 26 extending from Route 296 to U.S. Route 176.

MACADAM SUBBASE course is spread and compacted to 7-inch thickness.



New Section of South Carolina

Interstate No. 26 uses DEEP STRENGTH Asphalt Construction

The expanding pattern on the National System of Interstate and Defense Highways is nowhere shown to better advantage than in the State of South Carolina, particularly regarding mileage under contract and mileage constructed. Of the approximate 680 Interstate miles in this state, some 325 miles are under contract. About 180 miles are in the latter stages of construction or open to traffic.

This record is the result of a combination of important factors, among which may be mentioned careful planning, an aggressive and intelligent group of State Highway Engineers, and the adoption of *stage construction* wherever feasible. Last but not least, the use of Asphalt in combination with local aggregates to reduce costs, speed construction, and give the State a highway system which is durable, smoother-riding, and well able to support any traffic loads of the foreseeable future.

An excellent example of South Carolina Interstate Highways is a section of I #26 in the vicinity of Spartanburg. Rainfall and temperatures are normal for the Southern region, and frost conditions are not a serious factor. The design includes a selected top-soil sub-grade, reinforced with crusher-run stone, an Asphalt-primed macadam subbase course, an Asphalt plant-mix macadam base and an Asphalt concrete binder and wearing course.

Asphalt base was a plant-mix macadam with aggregate graded from the No. 4 sieve to 2½ inches, heated and coated with 3% to 4% of 85-100 penetration Asphalt, laid 5 inches thick in one layer. (Recent contracts specify a smaller stone constructed in two layers.)

Shoulders follow the general criteria for the Interstate system, with 10-foot surfacing for the outside lane and 3-foot for the inside lane. Features that materially reduced shoulder costs were the use of selected material for the foundation course with a 6-inch uniform macadam base and an Asphalt single-surface treatment with ½-inch stone for cover.

Compaction was performed on the pavement structure with three wheel steel rollers, high contact pressure pneumatic tire rollers and tandem steel wheel rollers.

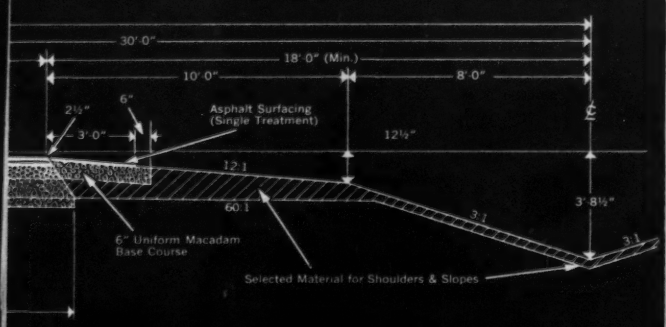
A study of the section below shows how this DEEP STRENGTH Asphalt design assures heavy-duty strength and durability. This application of DEEP STRENGTH Asphalt design principles is the result of many years of study, research, and experience in using local materials in combination with Asphalt by engineers of South Carolina's State Highway Department. Their invaluable engineering experience has saved many millions of taxpayer-dollars and provided extra mileage of Interstate Highways.

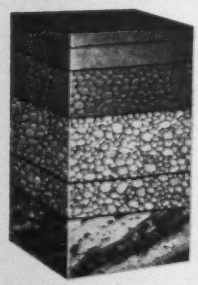
A new edition of the ASPHALT HANDBOOK incorporates all the Advanced Design Criteria implied in the term DEEP STRENGTH Asphalt Pavement. Write us for your free copy.

MULTI-LAYER SECTIONS consolidated for smoother riding by high contact pressure pneumatic tire rollers.

36-foot DEPRESSED MEDIAN with deep longitudinal drains assures good drainage and lowered water table.

THE ASPHALT INSTITUTE College Park, Maryland





HERE'S THE DEEP STRENGTH DESIGN OF SOUTH CAROLINA INTERSTATE NO. 26:

—A.	A. Asphalt concrete wearing course	1½"
—B.	B. Asphalt concrete binder course	2½"
—C.	C. Asphalt stabilized macadam	5"
—D.	D. Asphalt primed macadam subbase course	7"
—E.	E. Stabilized material	4"
—F.	F. Subgrade or Improved Subgrade	—
	TOTAL THICKNESS	20"

Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR Issues for OTHER PRICES:

- Iron & Steel Products, Pipe: Last, Nov. 16; Next, Dec. 14.
- Wood Products, Glass, Explosives, Chemicals: Last, Nov. 23; Next, Dec. 21.
- Clay Products, Limes, Plaster, Paint, Roofing: Last, Nov. 30; Next, Dec. 21.
- Wage Rates, Building Board, Lath, Insulation: Last, Nov. 30; Next, Dec. 21.

CEMENT, AGGREGATE, READY MIXED CONCRETE - F. O. B. CITY

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	†Toronto
Cement, Port., bulk	CL	bbl.	$3.69a	$3.91a	$3.50cf	$4.53ap	$4.02ag	$4.34c	$3.89	$3.34a	$4.39a	$3.79agq	$3.97a	$3.71c	$4.17a	$3.65b	$4.20a	$4.01#ae	$4.62bj	$4.09a	$3.85c	$3.75ag	$2.96de#	$3.84t
paper	"	"	4.32a#	4.42a	4.43c	5.83ip	4.52ag	4.90c	4.77#	3.84a	4.89a	4.29a	4.30a	4.15c	4.68a	4.17b	4.70a	4.51#ae	5.65bjk	4.59a	4.42c	4.47#a	3.26#de	4.00i
mortar	"	"	3.64a#	3.56a		4.90imp	4.15g	4.32c	4.19#ae	3.72a	4.89	3.88a	4.52a	4.65c	4.26a	3.97b	3.77a	3.63#e	5.00bjl	4.24a	4.86c	4.65a	3.31#de	4.00i
Gravel, 1½"	"	ton	2.25a#	2.80a#	2.65ns	3.00qsz	3.78#e	2.29#cu	2.25ae	2.55#a	1.95	2.50#abm		2.50#at	2.70#ae	2.61b		1.95#a	2.68#aqv	3.50#as	2.02	4.25#bm	1.90#a	2.40
¾"	"	"	2.50a#	2.80a#	2.65ns	3.00qsz	3.78#e	2.34#cu	2.25ae	2.60#a	2.15#	2.50#abm		2.71#at	2.70#ae	2.61b	3.20bk	1.95#a	2.68#aqv	3.50#as	2.02	4.25#bm	2.15#a	2.40
Sand	"	"	2.00a#	2.25a#	1.30ns	3.00qsz	4.13#e	2.44#cu	1.75ae	1.65#	1.42#b	2.16#abm	1.70#a	2.41#at	1.60#ae	2.16#b	2.45bkw	1.55#a	3.08#aqv	2.50/3.50#as	2.12	4.25#bm	2.40#a	2.05
Crushed stone, 1½"	"	"	3.10a	2.85a#	2.25s	1.75qsz	3.95#be	2.55#cu	2.70fy	2.57		2.80#abm	2.10#a	2.41#at	4.00#ae		2.85blbb	2.00#a	2.00#aqv	1.75js	2.17	4.50#bm	1.90#	2.40
¾"	"	"	3.10a	2.90a#	2.25s	1.85qsz	3.95#be	2.74#cu	2.70fy	2.77	3.00#x	2.80#abm	2.10#a	2.46#at	4.00#ae		2.85blbb	2.30#a	2.00#aqv	1.75js	2.17	4.50#bm	2.15#	2.40
Crushed slag,* 1½"	"	"	3.90r	2.05a#	1.95d		2.25#e	1.80u	2.30#f			3.15aqaa				1.95d		2.25#a	2.10w	1.80			2.00	2.40
¾"	"	"	3.90r	2.00a#	2.05d		2.25#e	1.80u	2.30#f			3.50aqaa				2.05d		2.35#a	2.10w	1.85			2.00	2.40
Concrete block, 8"x8"x16"																								
Sand/gravel	TL	ea	0.19o	0.18a	0.19	0.24o	0.26#e	0.19o			0.25	0.24u	0.22a	0.16f	0.20q	0.25r	0.276no		0.22rx	0.26#o	0.24	0.288s	0.20	0.26
Lt. wgt. agg	"	"	0.225o	0.18a	0.19	0.305ao	0.26#be	0.25ar	0.24f	0.255	0.27ao	.27#au	0.27c	0.26		0.25	0.32bo	0.20	0.22rx	0.32#co	0.25el	0.384es	0.28t	0.30eu
Concrete, ready-mix'r		cy	13.00g	13.50ou	14.75q	15.00q	12.50-13.00e	15.00gr	16.95u	11.50x	11.90	15.50eaa	13.50	12.65hix	14.55f	14.25o	17.60ay	14.65x	16.15o	13.65/14.10q	13.25ew	14.70j	10.80ek	11.75q

Delivered. * F.o.b. plant. ** Add 4% sales tax. ## Add 2% Intrastate sales tax. R Revised. † Plus 6% Mun & Prov tax.

CEMENT: •a Less 10¢ disc. 15 days. •b Less 2% disc. 15 days. •c Less 10¢ disc. 10 days. •d 10¢ disc. 20 days. •e Truckload lots. •f Fob mill, add $14.58 to $21.31 per car switching charges. •g fob mill + freight. •h LCL. •i Less 2% disc. 10 days. •j Truck lots, fob yard. •k 100 bag lots. •l over 150 sacks. •m Sold in bags only. •n Less 5% disc. 30 days. •o Plus 50¢ for Sat. del. •p 5-8 ton truckload. •q F.o.b. mill •r 50 cy & over •s In bags & bbl. Only. •t min. 7 tons

SAND, GRAVEL, STONE & SLAG: •a Truck lots. •b Per cu. yd. •c 5 tons up. •d Less 5¢ disc. 10 days. •e Less 2% disc. 10th. •f Less 2% disc. 15th. •g Less 5% for cash. •h Less than 5 tons. •j F.o.b. quarry. •k Barge lots asd. •l F.o.b. scow Hudson river. •m Less 2% for cash. •n F.o.b. cars. •o F.o.b. yard. •r less 5% disc. 15th. •s Less 2% disc. 10 days. •t Less 10¢ disc. 10 days. •u Less 5¢ disc. 10 days. •v Less 2% disc. 15 days. •w Less 10¢ disc. 15 days. •x Incl. 35¢ switch charge. •y F.o.b. dock. •z 5-8 tons. •aa Less 8% disc. 15 days. •bb Less 2% 25th of month

CONCRETE BLOCK: •a Cinder. •b Waylite. •c Haydite. •d Celecrete. •e 5¼ x 8 x 12 in. •f 8 x 4 x 16 •g F.o.b. truck at job. •l F.o.b. plant San Rafael. •m F.o.b. yard. •n 8 x 8 x 18. •o Less 2% disc. 10 days. •p Less 2% disc. 10th, •q Less 5% disc. 10th. •r Less 2% disc. 15 days. •s Less 2% disc. cash. •t Siporex, 7 x 8 x 18. •u Less 5% disc. 10 days. •v Less 12% disc. 15th.

READY MIXED CONCRETE: •a 6 cu yd or over del. Man. •b 25 cu yds or more. •c 10-100 cy. •d 1-3 mi. zone add 15¢ for ea. add'l 1-mi. zone. •e 3,000 lb comp. •f 2,500 lb. comp., less 5% disc. 30 days. •g Less 25¢ disc. 15 days. •h Less 50¢ for cash. •i 5% off for cash. •j 2% off for cash. •k Federal tax included. Add 6% mun. & prov. tax. •l 1:2½:3½ base price. •m F.o.b. yard. •n Plus escalator clause. •o Less 2% disc. 15 days. •p Less 50¢ disc. 15 days. •q Less 2% disc. 10 days. Add 50¢ per zone. •r 2000 wgt. •s Less 5% disc. 10 days. •t Incl. 50¢ heating. •u Less 2% disc. 15th •v Sat. del.+50¢. •w 10-100 cy. •x Del in zone 20-8. •y less 25¢, 10 days. •z less 1% in 30 days. •aa 6 bag mix

MILL PRICES FOR BULK CEMENT: Subject to 10¢ discount, 15 days. For paper bags add 50¢ per bbl., not refundable. *Prices guaranteed through December 31, 1961*

Richard City, Tenn	$3.55	Bath, Pa	$3.50	Northampton, Pa	$3.50	Leeds, Ala	$3.40	Howes Cave, N. Y.	$3.50	Oswego, N. Y.	$3.60	Green Bay, Wis	$3.60
Clinchfield, Ga	3.55	Lesley, Pa	3.50	Universal, Pa	3.60	Duluth, Minn	3.60	Muskegon, Mich	3.55	Cleveland, O	3.65	Ironton, O	3.65
Kingsport, Tenn	3.55	Buffington, Ind	3.55	Waco, Tex. (+ 10 tax)	3.35	Hudson, N. Y.	3.50	Saginaw, Mich	3.60	Alsen, N. Y.	3.50	Montreal, Canada (a)	2.80
West Des Moines, Iowa	3.65	Independence, Kan	3.35	Giant, S. C.	3.55	Alpena, Mich	3.50	Wyandotte, Mich	3.60	Toledo, O	3.60	W. Winfield, Pa	3.60
Nazareth, Pa	3.50	Hannibal, Mo	3.55	Steelton, Minn	3.60	Detroit, Mich	3.60	Buffalo, N. Y.	3.55	Milwaukee, Wis	3.60	Security, Md.	3.50

•a 350 lb. bbl.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS - F. O. B. CITY

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
Paving brick, block-																								
Brick, 3"x4"x8½"	CL	M	e	e	e	e	$150.00#ab	e	e	e	e	e	e	e	e	e	e	e	$60.00k	e	e	e	e	e
Granite, 4"x4"x8"	q	M	e	e	$66.00i	e	95.00#a	e	89.50	40/80	62.00a	$114.00	e	e	e	e	e	e	95.00n	e	$70.00	e	e	$120.00#f
Wood, 3½" 16 lb		sy	e	e	e	e	3.95/4.00aj	e	6.30	e	e	e	e	e	e	e	$3.57	e	6.35n	e	e	e	e	4.50f
Asphalt, paving																								
Tank car	CL	ton	$0.1182W	$21.00	25.12 O	$22.00apS	22.00b	$26.00SU	24.00tA	26.90		31.00#	$18.75el	$18.00dmx	23.70	$20.00e	22.90mO	0.21u	31.20isv	$19.74	21.50gdd	$24.00z	$30.50n	38.90
Drummed	CL	gal.	0.1220W		25.69	46.00apS	32.00b			46.35							67.83mO			21.65	41.00gdd	47.00h	43.60n	59.01ee
Asph. binders, fluxes																								
Tank car	CL	gal.	0.1182W	0.9i	0.1069	22.00avS	20.40bv	26.00ffv	24.00tvA	.1138		31.00#	18.75cv	18.00dvx	23.70	20.00ev	22.90vtO	0.21u	31.20isv	.1825f	21.50gkvdd	33.00vscc	0.167u	0.2135ee
Drummed	CL	gal.	0.1220W	0.18i	0.1093	46.00avS	30.40bv			.1983							67.83vtO			.1825	41.50gkvdd	38.50	0.211n	0.2367w
Asph. cutback, MC																								
Tank car	CL	on	0.1222W	0.9i	0.1163w	0.105awF	.10bwH	0.1165twAF	0.1050wSU	30.50		30.24wl#	.0825cwJ	19.50dKx	0.105w	0.095ew	10.16uF	0.095U	0.1403#S	.09f	22.50gNdd	25.50KE	17.80nuE	0.18wee
Drummed	CL	gal	0.1258W	0.18wE	0.1188Ow	0.22awF	.18bwH			52.45							29.62uF			.092fw	46.50gNdd		22.20nuE	0.235
Road oil, tank car	CL	gal		0.95i	0.1006O	0.14aOR	.08b	0.109		.1100		27.84v	.06751e	18.50dvaa	0.95	0.085eB		0.095U	0.14#S	.165f	23.25gvWdd	28.75hvY	0.155n	0.191w
Asph. emul. RSI																								
Tank car	CL	gal.	0.1288W	0.10i	0.1069	0.150R		0.1265		0.1138		0.152	.10	21.40jXv	0.132bb	0.095eBL	10.15u		0.1403i	.18250	23.50gvXdd	25.80hvX	0.242n	0.204Zee
Drummed	CL	gal	0.1327W	0.19i	0.1093O				0.21A	0.1983		0.29		.1842jXv		0.1905eB	29.81u			.30	.455gXdd	49.80hrvX	0.27nX	.26Zee

PAVING BRICK & BLOCK: •a Less 2% disc. 10th. •b 3 x 3¼ x 8. •c 2¼ x 8 x 4. •d Truckload lots. •e Not used. •f 2" interior 6 lb tr. •g Less $1/Mdisc. 15th. •h 2" tr. 8 lb. •i 3 x 3½ x 8½. •j 2½", 6 lb. tr. •k Used. •l Redshale. •m Pine; oak $8.57. •n Truck del. •o Less $1 M disc. 15 days. •p Used: $40; new: $80. •q Lots of 50M.

ASPHALTS: •a F.o.b. refinery, Everett, Mass. •b F.o.b. refinery, Lockport, Ill. •c F.o.b. Sugar Creek, Mo. •d F.o.b. refinery, El Segundo. •e F.o.b. Baton Rouge. •f F.o.b. Hartford, Ill. •g F.o.b. refinery, Richmond, Calif. •h F.o.b. Martinez. •i F.o.b. refinery, Baltimore. •j F.o.b. refinery, Inglewood, Calif. •k 50-110 penetr. •l Less than 100 penetr. •m 40/300 penetr. •n F.o.b. refinery, Montreal. Fed. tax included; add 6% for mun. & prov. •o Drums not avail. Shipped in steel bbl. •p 60/70 penetr. •r In customer's drums. •s Shipped in drums, per drum. •t 150/300 penetr. •u Per 100 gal. •v Per ton. •w Per gal. •x Also tank trucks •y F.o.b. Oakland. •z F.o.b. Edmonds. •A F.o.b. refinery, Cleveland. •B F.o.b. Destrehan, La. •E RC. •F Also RC. •G Also MS •H RC 0-5 incl. •I MC 4. •J MC, RC $0.095. •K MC 3, 4, & 5. •L MS. •M MC 1-5, RC 1-5, $0.0918. •N MC 3. •O Truckload. •P F.o.b. refinery, Atlanta. •Q F.o.b. Eldorado, Ark. •R Delivered within 50 mi. •S Less 2% disc. 10 days, net 30. •T Less 1% disc. 10 days. •U F.o.b. refinery. •V Less 2% disc. 15 days. •W SC 2. •X RS 1. •Y SC 1. •Z Incl. 10% Sales Tax. •aa SC 3, 4, & 5. •bb RS 3. •cc In used drums. •dd less disc of $1 ton. •ee 45 Imp. gal. drums •ff 60-150 penetration

DIESELS:

Shell reveals how a special additive in Shell Dieseline can help you cut downtime and maintenance costs

Shell Dieseline® contains a remarkable additive called FOA-5X®. This additive was developed by Shell Research specially to help keep fuel line filters clean, and prevent injector corrosion.

Read how Dieseline with FOA-5X can help you cut downtime and maintenance costs—and get top engine performance.

Shell Dieseline is available in grades to meet all engine requirements. Ask your Shell representative to specify the correct grade for your equipment.

SHELL Dieseline contains a special additive called FOA-5X®. Here are three important moneysaving jobs FOA-5X does for your diesel fuel systems.

1. FOA-5X helps keep Shell Dieseline clean and free of sediment, even during prolonged storage.

2. FOA-5X can help reduce diesel engine downtime by helping fuel filters and injectors to remain unclogged and clear. It inhibits sediment formation and helps keep tiny contaminants finely divided so they flow freely through screens and nozzles.

3. FOA-5X helps prevent corrosion and rust.

Maximum economy

The uniformity of Shell Dieseline enables injector nozzles to work efficiently. And it lets your mechanics tune an engine's fuel injection system for maximum economy.

The viscosity of all Dieseline is controlled to help provide proper lubrication of pumps and injectors.

Minimum knock, fast starting

The ignition quality, measured by cetane number, is tailored to your engine requirements. Results: controlled combustion, minimum diesel knock and good starting characteristics.

Shell Dieseline can help produce maximum engine power. And can make a significant difference in your diesel equipment. That difference is *top engine performance.*

Grades for all engines

Shell Dieseline is available coast to coast in grades to meet all engine requirements.

How to learn more about Dieseline

For additional information on Shell Dieseline, contact your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL

A Bulletin from Shell
—where 1997 scientists are working to provide better products for industry

Bids Asked—Low Bidders—Contracts Awarded

NEW ENGLAND

HEAVY CONSTRUCTION—SLC

▲ **Conn., Groton**—General Dynamics Corp., Electric Boat Div., Eastern Boat Rd., soon lets contract GRAVING DOCK, $3,000,000. Christopher J. Foster, 44 Whitehall St., New York 4, N. Y., engr.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Brooklyn**—BA 1/9—New York City Housing Auth., 299 Broadway, New York, Zone 7, (1) fdns. and general constrs. (2) heating and ventilating work (3) electrical work and (4) plumbing work, DeKalb HOUSES, Proj. No. NY-5-54, Pulaski St., Stuyvesant Ave., DeKalb Ave., Sumner Ave. and easterly portion of area bounded by DeKalb Ave., Lewis Ave., Kosciusko St. and Sumner Ave., Brooklyn Boro. $7,500,000. Plans deposit $75. CD 8/24/61.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK** State Dpt. P. Wks., State Office Bldg., Albany, BRIDGES,

Hendrickson Bros., Inc., 86 Trinity Pl., New York, Zone 6, N. Y., CA **$8,760,046**, est. $10,243,000, track reloc. RR Sta. and misc. 3.32 mi., c. conc. 0.06 mi., 8 RR gr. seps. plate girder, 1 viaduct rein. conc., I-beam and girder elim. of grade crossings of L. I. RR with various streets in Hicksville (Main Line-Port Jefferson Div.) PSC 10324, Nassau Co. BA 10/5/61. CD 10/6/61, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROADS,

Andrey Catapano Co., Inc. & Grow Constr. Co., Inc., & A. J. Orlando Co., New York, N. Y., CA **$4,073,495**, est. $4,171,000, 9 in. c. conc. pavt. 0.57 mi. (1.03 acc.) 3 comp. I-beam and plate gird. viads., 2 comp-I-beam viads. 1 hy. gr. sep. comp. I beam, 1 ped. overpass plate girder Van Wyck Expwy. Ext Contr. 3 (Kew Gardens Interchange) FAVWE 61-4, Proj. U-1085(22), Queens Co. BA 10/26/61, CD 10/27/61, under LB

▲ **Wright & Kremers, Inc.,** Pine Ave. and Main St., Niagara Falls, N. Y., CA **$3,880,935**, 2 story OBSERVATION (Overlook) BLDG., 1 story, bsmnt., fdn. 89 sq. ft. RECEPTION BLDG., for Robert Moses Niagara Power Plant, Lewiston, Niagara Co., Spec. No. PA-N-23043, Niagara Contr. No. N34, NEW YORK. Power Auth. State of New York, 18 Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. BA 11/9. CD 11/10/61, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 11/22, ROAD,

Poirier & McLane Corp., 33 West 42nd St., New York, N. Y., LB **$5,119,937**, (9 bidders), grading, paving and bridges 0.899 mi. Rte. 80, Section 5R from Senate St. to Main St., Proj. I-80-5(21)62, Bergen Co. CD 10/23/61.

BUILDINGS—LB & CA

▲ **Depot Constr. Corp.,** 42-15 Crescent St., Long Island City 1, N. Y., CA **$8,875,000** general contract 10 story, 218 x 218 ft. OFFICE, 1 story, bsmnt. 144 x 192 ft. BLDG. No. 8, Campus Site for Dpt. Taxation & Finance, ALBANY, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. Grand total **$12,978,658**. BA 11/1, CD 11/6/61, under LB;

A. J. Eckert Co., Inc., 1062 Central Ave., Albany, N. Y., CA **$1,927,777**, heating contract for 10 story OFFICE, 1 story, bsmnt. BLDG. NO. 8, Campus Site for Dpt. Taxation & Finance (Albany, N. Y.);

Nager Electric Co., Inc., 420 Broadway, Brooklyn, 11, N. Y., CA **$1,496,000**, electric contract 10 story OFFICE, 1 story, bsmnt. BLDG. NO. 8, Campus Site for Dpt. Taxation & Finance, (Albany, N. Y.);

Otis Elevator Co., 1 Columbia Pl., Albany, N. Y., CA **$679,881**, elevator contract for 10 story OFFICE and 1 story, bsmnt. BLDG. NO. 8, Campus Site for Dpt. Taxation & Finance (Albany, N. Y.).

▲ **Diesel Constr. Co., Inc.,** 642 5 Ave., New York 19, N. Y., CA Est. **$3,000,000**, 17 story OFFICE and STORES, 300 E. 42 St. and 770 2 Ave., NEW YORK, N. Y. Harlem Savings Bank, c/o Fred French Investing Co., 551 5 Ave., New York, N. Y. CD 11/16/61.

▲ **Mahony-Troast Constr. Co.,** 790 Bloomfield Ave., Clifton, N. J., LB **$4,812,122**, (7 bidders), WEST WING HOSPITAL ADDN., ENGLEWOOD, N. J. Bd. Trustees Englewood Hospital, 350 Englewood Ave., Englewood, N. J. BA 11/21/61. CD 11/20/61.

▲ **Logan Manders,** 2620 Eye St. N.W., Wash., D. C., CA **$4,000,000**, 10 story, 206 units, Howard Johnson MOTOR LODGE, 2601 Virginia Ave. N.W., WASH., D. C. The Virginia Co., 915 19th St. N.W., Wash., D. C. Chatelain, Gauger & Nolan, 1632 K St. N.W., Wash., D. C., archts.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **Johnson Drake & Piper, Inc.,** 3350 Peachtree Rd., NE, Atlanta, Ga., CA **$3,363,424**, INCINERATOR, S. Cobb Dr., ATLANTA, GA. City, City Hall, Atlanta, Ga. BA 11/13/61. CD 11/20/61, under LB.

▲ **LOUISIANA**—State Dpt. Hys., Rm. 426, Headquarters Admin. Bldg., Baton Rouge, BRIDGE,

Blount Bros. Constr. Co., 79 Commerce St., Montgomery, Ala., CA **$4,791,357**, steel, concrete bridge structure Lake Charles Interstate Hy. By-Pass (Calcasieu River Bridge-West Approach) 0.878 mi. SP No. 450-30-04 FAP No. I-210-1(37) 26, Calcasieu Parish. BA 10/18. CD 10/23/61, under LB.

BUILDINGS—LB & CA

▲ **Daniel Constr. Co.,** P.O. Box 2286, Greenville, S. C., CA Est. over **$3,000,000**, FIBER GLASS MFG. PLANT ADDN., AIKEN, S. C. Owens-Corning Fiber Glass Corp., 601 Madison Ave., Toledo, O.

▲ **Barge & Co.,** 290 14th St., NW, Atlanta, Ga. CA Est. **$3,000,000**, 17 story, 127,500 sq. ft. BANK-OFFICE, ATLANTA, GA. First Federal Savings & Loan Association of Atlanta, 46 Pryor St., NE, Atlanta, Ga. Tomberlin & Sheetz, **1429 Peachtree** St., NE, Atlanta, Ga., archts.

▲ **Thompson & Street Co.,** 2622 Piedmont Rd., NE, Atlanta, Ga., LB **$8,664,400**, 650 units low rent HOUSING, Proj. GA 6-12, ATLANTA, GA. Atlanta Housing Auth., 824 Hurt Bldg., Atlanta, Ga. BA 11/21/61. CD 10/23/61.

▲ **The Fluor Corp., Ltd.,** 2500 S. Atlantic Blvd., Los Angeles 22, Calif., CA design and construct 100,000 bbl./day CRUDE DISTILLATION UNIT, 32,000 bbl./day CATALYTIC REFORMER, 18,000 bbl./day ISOCRACKER, 19,000,000 cu. ft. day HYDROGEN MANUFACTURING PLANT and BOILER PLANT, Bayou Casote, PASCAGOULA, MISS. Standard Oil Co. of California with Standard Oil Co. of Kentucky, 225 Bush St., San Francisco, Calif. BA 10/25/61, CD 10/25/61;

Chicago Bridge & Iron Co., 1305 W. 105 St. Chicago, Ill., CA TANKS for refinery (Pascagoula, Miss.).

▲ **Pickens & Bond Constr. Co.,** Gazette Bldg., Little Rock, Ark., CA **$2,671,609**, ALUMINI COLISEUM, SWIMMING POOL, etc., Eastern State College, RICHMOND, KY. Commonwealth Ky., Div of Purchases, Frankfort, Ky. Hartstern Louis & Henry, McDowell Bldg., 3 and Walnut Sts., Louisville 2, Ky., archts. E. R. Donald & Assoc., 554 S. 3 St., Louisville 2, Ky., engrs. CD 10/26/61, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **S. A. Healy Co. & Gargaro Co.,** 6551 E. 7 Mile Rd., Detroit 34, Mich., LB **$3,258,503**, Contr. 2, 15,700 lin. ft. 8 ft. 6 in. SEWERS in tunnel, Rouge Valley Sewage Disposal System, DETROIT, MICH. Wayne County Bd. P. Wks., Rm. 1322, City-County Bldg., Detroit 26, Mich., BA 11/21/61; CD 11/8/61;

Santucci Constr. Co., Skokie, Ill., LB **$1,597,600**, Contr. 4, 4,200 lin. ft. SEWERS, 6 ft. 6 in. to 5 ft. 0 in. in tunnel, 11,100 lin. ft. 8 ft. 6 in. to 5 ft. 0 in. in open cut, Rouge Valley Sewage Disposal (Detroit, Mich.);

D. Agostini Constr. Co., 27283 Jean Ave., Warren, Mich., LB **$385,732**, Contr. 5, 6,200 lin. ft. 5 ft. 6 in. to 30 in. open cut Rouge Valley Sewage Disposal System (Detroit, Mich.).

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ **Neb, Omaha**—B 12/21—Arch Bishop Bergen-Mercy Hospital, Bd. Directors, 9th & Forest Ave., 5 story, 258 bed, St. Catherine's Mercy HOSPITAL, $4,914,500. Plans deposit $100. Leo A. Daly Co., 8600 Indian Hills Drive, Zone 14, archt. CD 1/28/59.

BUILDINGS—LB & CA

▲ **Henry C. Beck Co.,** First National Bldg., Dallas, Tex., LB **$3,688,673**, est. $3,750,000 (6 bidders), 18 story OFFICE ADDN., OKLAHOMA CITY, OKLA. Kerr-McGee Oil Industries, Kerr-McGee Bldg., Oklahoma City, Okla. BA 11/1/61. CD 10/6/61.

▲ **Lippert Bros. Co.,** 2800 N. Santa Fe St., Oklahoma City 5, Okla., CA Est. **$3,000,000**, MEAT PACKING PLANT, OKLAHOMA CITY, OKLA. Wilson & Co., Prudential Plaza, Chicago, Ill. Henchien, Evards & Crombie, 59 E. Van Buren St., Chicago, Ill., archts. CA 11/10/61. CD 10/9/61.

FAR WEST

BUILDINGS—BA

▲ **Hawaii, Honolulu**—BA 12/21—University of Hawaii, University Ave. and Dole St., INSTITUTE of GEOPHYSICS, Haleakala Observatory, Haleakala. Lublin, McGaughy, & Assocs., 909 Halekauwila St., Honolulu, Hawaii, archts. CD 7/6/60.

HEAVY CONSTRUCTION—LB & CA

▲ **ARIZONA**—State Hy. Dpt., 206 S. 17th Ave., Phoenix, ROADS,

† **Vinnell Corp.,** P.O. Box 8097, Phoenix, Ariz., CA **$3,057,796**, est $3,755,949, (9 bidders), grading, furnishing, placing select material aggregate base, b. conc., furnishing, applying emulsified asphalt seal coat, beginning Nevada-Arizona State Line on U. S. Rte. 91, extending northeasterly over New alignment for approx. 8¼ mi. to Littlefield, Mesquite-Littlefield Hy., Mohave Co.; CA **$1,166,556**, est. $1,445,334, (6 bidders), grading, subgrade seal, select material, aggregate base, b. conc., emulsified asphalt seal coat, beginning about 14 mi. northeast of Globe, extending northeasterly partially over new alignment of U. S. Rte. 60 approx. 6¾ mi. toward Show Low, Globe-Show Low Hy., Gila Co. BA 11/17/61. CA 11/17/61.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, ROAD,

Charles L. Harney, Inc., 575 Berry St., San Francisco 7, Calif., CA **$5,626,170**, 1.1 mi. six-lane section Southern Freeway between 0.3 mi. north of Ocean Ave. and Mission St., San Francisco Co. BA 11/1. CD 11/3/61, under LB.

▲ **Fruin-Colnon Contracting Co.** and **Alex Robertson,** 48 Park Rd., Burlingame, Calif., CA **$7,587,427**, WATER FILTRATION PLANT, American River near Sacramento State College, SACRAMENTO, CALIF. City Council, City Hall, 9 and I Sts., Sacramento, Calif. BA 11/16, CA 11/22, CD 11/21/61, under LB.

BUILDINGS—LB & CA

▲ **Christiansen Bros., Inc., and R. Pawlsen Constr. Co.,** Box 1925, Salt Lake City, Utah, CA **$7,937,111**, est. $2,000,000, Phase II, MEDICAL CENTER, incl. electric, heating and plumbing, University of Utah, SALT LAKE CITY, UTAH. Utah State Bldg. Bd., 419 State Capitol, Salt Lake City, Utah. BA 11/14/61, CA 11/26/61. CD 10/3/61.

▲† **Diversified Builders, Inc.,** 6855 S. Rosecrans, Paramount, Calif., CA **$5,975,000**, AIR STORAGE SYSTEM and ADDNS. to EXPERIMENTAL FACILITIES at the Pluto Test Area, Tory II C Reactor, Nevada Test Site, MERCURY, NEV. Atomic Energy Comn., 1235 Main St., Las Vegas, Nev. BA 11/7/61. CD 10/4/61.

▲† **U. S. Eng.,** 1519 S. Alaskan Way, Seattle 4, Wash. cancelled bids to have been opened Dec. 20, 500 unit CAPEHART FAMILY HOUSING, Proj. 62-20, FORT LEWIS, WASH. **$8,000,000.** CD 11/15/61. Will readvertise.

▲ **M. H. Golden,** 3485 Noell St., San Diego 1, Calif., CA Est. **$5,000,000**, 18 story, 190,000 sq. ft. structural steel BANK, SAN DIEGO, CALIF. Home Federal Savings, 701 Broadway, San Diego 1, Calif. Frank L. Hope & Assoc., 1475 6 Ave., San Diego 1, Calif. archts. CA 11/13.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **SAUDI ARABIA**—BA 1/7—Ministry of Communications, Riyadh, ROAD,
124 mi. hy. from Buraydah to Unayzah, Assirr Area. CD 11/17/61.

▲ **SAUDI ARABIA**—BA 1/22—Ministry of Communications, Riyadh, ROAD,
253 mi. hy. from Riyadh through Ash-Shu'ayb, Al-Mahmal and Sudayr. CD 11/17/61.

▲ **SAUDI ARABIA**—BA 2/5—Ministry of Communications, Riyadh, ROAD,
334 mi. hy. from Ad-Duwadami to Al-Hawiyah. CD 11/17/61.

For additional reports see CONSTRUCTION DAILY REPORTS SECTION

PROPOSED PROJECTS

WATER SUPPLY

▲ **Mo., St. Louis**—City, Bd. P. Service, 304 City Hall, Zone 3, **$7,500,000** bond election Jan. 23, WATERWORKS SYS. IMPRVS. and EXTENSIONS, incl. WATER MAINS, etc. Bids 1962-1963. CD 4/25/57.

▲ **N. Y., Elma**—Town, Town Hall, WATER SYSTEM. **$4,046,000.** John Rutherford Campbell, Dunn Bldg., Buffalo, consult. engr. Bids May 1962. CD 6/3/59.

SEWERS, WASTE DISPOSAL

▲ **Ill., Rockford**—City, City Hall, voted $4,000,000 bonds Nov. 7, STORM DRAINAGE, CD 10/23/61.

▲ **Mich., Pontiac**—Oakland County Drain Comn., 550 S. Telegraph Rd., Dequindere Rd., SANITARY SEWERAGE SYS. from Troy to Detroit, **$6,000,000**, Beds about Jan. 2; 2,500 lin. ft. Red Run DRAIN, Royal Oak, $1,320,000, Bids about Jan. 2.

▲ **N. J., Paterson**—Paterson Sewer Authority, City Hall, RENOVATION, RECONSTR. SEWERAGE SYSTEM. **$10,000,000-$15,000,000.** Havens & Emerson, 233 Broadway, New York, N. Y., consult. engrs. To be carried out over a 7-8 year period.

▲ **N. Y., Hamburg**—Town, Town Hall, SANITARY SEWERAGE SYS., 2 BOOSTER PUMPING STATIONS, SEWAGE TREATMENT PLANT, MAIN PUMPING STATION, OUTFALL SEWER to Lake Erie. **$3,500,000.** Nussbaumer, Clarke & Velzy, 327 Franklin St., Buffalo 2, N. Y., and Herthe & Sonnenberg, 60 Niagara St., Buffalo, N. Y., consult. engrs. Bids January 1962. CD 10/7/60.

▲ **Ont., Hamilton**—City, City Hall, approx. 5 mi. INTERCEPTOR SEWER from Stroud Rd. in west end to Gage Ave., in east end of city, $3,500,000; 8,000 ft. SANITARY SEWER, parallel with Chedoke Expressway, **$300,000.** CD 2/6/56.

BRIDGES

▲ **NOVA SCOTIA**—Dpt. Hys., Parliament Bldgs., Halifax, BRIDGE,

Halifax—overpass at Bayers Rd. entrance to Halifax City, Bicentennial Dr. **$3,151,800.** BA late 1961.

STREETS AND ROADS

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROAD,

Bedford Co.—13 mi. sect. Rte. 220 between Centerville

and Bedford, incl. widening existing hy. and resurf. $3,500,000. Erdman, Anthony & Assocs., Inc., 1835 N. 3rd St., Harrisburg, consult. engr.

AIRPORTS

▲† **Calif., Moffett Field**—National Aeronautics Space Admin., Ames Research Center, Moffett Field, HYPERVELOCITY FREE FLIGHT FACILITY, Ames Research Center, $4,800,000 (appropriated); MODIFICATIONS to FLIGHT OPERATIONS LABORATORY, Ames Research Center, $800,000 (appropriated). CD 6/8/61.

▲† **Fla., Cocoa**—National Aeronautics & Space Admin., Atlantic Missile Range, Cape Canaveral, MODIFICATIONS to LAUNCH COMPLEX NO. 36, Atlantic Missile Range, $1,267,000 (appropriated); MODIFICATIONS to SATURN LAUNCH COMPLEX NO. 37, Atlantic Missile Range, $11,000,000 (appropriated). CD 6/8/61.

▲† **Fla., Cocoa**—National Aeronautics & Space Admin., Atlantic Missile Range, Cape Canaveral, COMPLETION of SATURN LAUNCH COMPLEX NO. 37, Atlantic Missile Range, $10,961,000 (appropriated). CD 6/8/61. MODIFICATIONS to SATURN LAUNCH COMPLEX NO. 34, Atlantic Missile Range, $2,535,000 (appropriated). LIQUID HYDROGEN SYSTEM for Saturn Launch Complex, Atlantic Missile Range, $2,800,000 (appropriated). SPACECRAFT FACILITY, Atlantic Missile Range, $801,000 (appropriated). CENTRAL SHOP and MAINTENANCE FACILITY, Atlantic Missile Range, $680,000 (appropriated). EXTENSION of ASSEMBLY BUILDING, Atlantic Missile Range, $1,000,000 (appropriated).

▲† **Md., Greenbelt**—National Aeronautics Space & Admin., Goodard Space Flight Center, ENVIRONMENTAL TESTING LABORATORY. $7,255,000 (appropriated). CD 6/8/61.

▲† **Virginia**—National Aeronautics & Space Admin., Wallops Station, Wallops Island, ADVANCED TRACKING SYSTEMS, Wallops Station, $6,500,000 (appropriated). DYNAMIC BALANCING FACILITY, Wallops Station, $835,000 (appropriated). MODIFICATIONS RANGE SAFETY SYSTEMS, Wallops Station, $225,000 (appropriated). ROCKET STORAGE AREA, Wallops Station, $400,000 (appropriated). CD 6/8/61.

▲† **Va., Langley Field**—National Aeronautics & Space Admin., Langley Research Center, Hampton, LOW FREQUENCY ENVIRONMENTAL NOISE FACILITY, Langley Research Center, $500,000 (appropriated); LUNAR LANDING FACILITY, Langley Research Center, $3,500,000 (appropriated).

UNCLASSIFIED

▲ **Okla., Tulsa**—City, City Hall, voted bonds Nov. 14, PARK IMPRVS. $3,600,000. CD 10/11/61.

PUBLIC BUILDINGS

▲ **Ill., Des Plaines**—School Dist. No. 207, 1755 Wolf Rd., defeated bonds Nov. 18, 3 story Maine Twp. SOUTH HIGH SCHOOL, SWIMMING POOL, Talcott Rd. and Devon Ave. $8,800,000. McCaughey, Erickson, Christman & Stillwaugh, Inc., 35 Prospect Ave., Park Ridge, Ill., and Caudill Rowlett & Scott Assocs., 3535 Edlow St., Houston, Tex., archts. CD 6/2/61.

▲ **Md., Rockville**—Montgomery Co. Bd. Educ., plans by McLeod & Ferrara, 1223 Connecticut Ave. N.W., Wash., D. C., Montgomery JUNIOR COLLEGE CAMPUS, Rte. 240 and Rte. 28. $3,500,000-$4,000,000.

▲ **Minn., Minnetonka**—Bd. Educ. Independent School Dist. No. 276, $4,400,000 bond election Dec. 12, two JUNIOR HIGH SCHOOLS. CD 3/28/61.

▲ **Minn., Roseville (P.O. St. Paul)**—Bd. Educ. Independent School Dist. No. 623, voted $3,500,000 bonds Nov. 14, SENIOR HIGH SCHOOL between Demont Ave. and County Rd. B, Little Canada and ELEMENTARY SCHOOL. CD 9/28/61.

▲ **Miss., Vicksburg**—City Housing Auth. plans by John L. Turner & Assocs., Petroleum Bldg., Jackson, 350 units low-rent HOUSING, MISS-86-1, 100 units; Miss-86-2, 250 units. $4,542,001. Bids early 1962. CD 9/7/61.

▲ **Okla., Tulsa**—Bd. Comrs. Tulsa Co., Courthouse, voted bonds Nov. 14, COUNTY LIBRARY, $3,800,000. George Straughn, Courthouse, co. engr. CD 10/17/61.

▲† **Pa., Harrisburg**—General Services Admin., 19th and F Sts. N.W., Wash., D. C., plans by Good-Long & Assocs., 904 N. 2nd St., Harrisburg, COURT HOUSE and FEDERAL OFFICE. $6,675,000. CD 6/23/61.

▲† **S. C., Charleston**—Southeast Division, Bureau Yards & Docks, Naval Base, plans by Reid Hearn & Associates, 600 Beltline Blvd., Columbia, and Cummings & McCrady, Champney's Alley, 200 CAPEHART HOUSING UNITS. $3,300,000. CD 9/7/61.

COMMERCIAL BUILDINGS

▲ **Ill. Chicago**—Owner c/o Erwin S. Wolfson, 529 5th Ave., New York 17, N. Y., plans by Skidmore, Owings & Merrill, 30 W. Monroe St., Zone 3, 18 story, 800,000 sq. ft. OFFICE, Madison and Monroe Sts. $20,000,000.

▲ **Mass., Boston**—Boston British Properties (Central & District Properties, Ltd., 12 Berkeley Sq., London W. 1, and E. Alec Colman Investments Ltd., 5 Hyde Park Gate, London S.W. 7, London, England), plans by Pearl Associates (F. A. Stahl, 1006A Massachusetts Ave., Boston, and Hugh A. Stubbins & Assocs., 806

(Continued on page 59)

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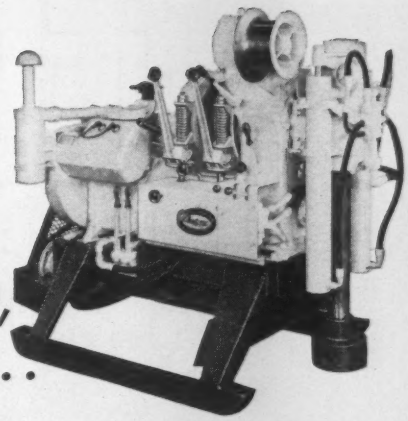

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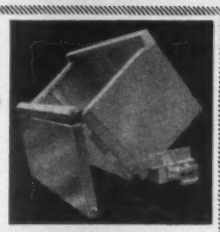

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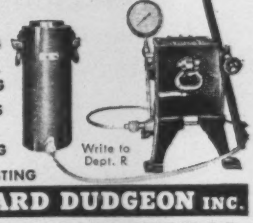

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STEEL 1961

JOINS STEEL 1899

in Louis Sullivan's Architectural Masterpiece

"There was never any question of the material to be used. Steel was the proper choice for the modern eight-story addition now in construction on the famous Carson Pirie Scott building in Chicago," says Mr. Harry F. Manning of the firm of Holabird & Root, architects. ■ Designed as a completely steel-framed structure by Louis Sullivan of the world famous "Chicago School" of architects in 1899, the original building has been added to in 1903, 1906 and now in 1961. Each addition has preserved the amazingly clean and modern lines of the original Sullivan design. As in the original conception, the great cellular elevations are bold, exact and perfectly proportioned articulations of the steel frame. Steel, the building material of proven strength, durability and economy has been used again in the latest addition. ■ In the first portion of the structure, columns were formed of a combination of angles and straps of formed plate. Columns in the new section make use of modern, high-strength, wide flange beams utilizing present day steel's far greater economy and far superior carrying capacity. ■ Among architects and engineers the world over, the Chicago School of the late 1800's has long been associated with the invention and mastery of steel framing and the consequent development of today's modern structures. As many point out, the contemporary statements of today are a refinement of the principles developed as early as 1879, the articulated wall taking its power and beauty from the formal possibilities of steel framed construction.

Use Steel for Modern Construction

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STEEL CONSTRUCTION PROVIDES

unlimited expansion potential

Additions to existing structures are relatively simple, with geometric steel framework repeating or augmenting the basic design of the original building. Joining new steel beams to old in the creation of new bays or even entire wings, is easier and far more economical both of time and money than is the case with most other types of building material.

design freedom

From the cube to soaring arches and space-spanning domes—from the triangle and the pyramid to tridimensional hexahedrons and tetrahedrons. From the simplest of warehouses to highrise office buildings or the complexities of church architecture, steel enhances free expression and architectural creativity.

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For today's modern steels have great load-carrying capacity—minimize dead load stress—reduce foundation costs—can be fabricated into forms of the utmost lightness and grace while lending rigidity and rugged strength to the structure.

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(Continued from page 57)

Massachusetts Ave., and William J. Messurier), 30 story OFFICE. $20,000,000.

▲ **N. J., Little Falls**—Fenlon Constr. Co., c/o John Celentano, Esq., 2 Clifton Ave., Clifton, plans by Leonard Feinen, 320 Lincoln Ave., Hasbrouck Heights, 226 unit APARTMENT, Wilmore Rd. $4,000,000.

▲ **N. Y., Buffalo**—Manufacturers & Traders Trust Co., 284 Main St., BANK and OFFICE, Main, Eagle, North Division and Washington Sts. $12,000,000.

▲ **N. Y., New York**—Dewey Carver, 51 E. 42 St., Zone 17, plans by Robert L. Bien, 342 Madison Ave., Zone 17, 21 story 310,000 sq. ft. 75x286 ft. OFFICE, 118-122 Church St. and 38-58 Murray St. $6,000,000-$7,000,000. Levy & O'Keefe, 171 Madison Ave., mech. engrs. Weinberger Frieman Leichtmann & Quinn, 20 Vesey St., struct. engrs. CD 1/26/61.

▲ **Tex., Dallas**—Republic National Bank of Dallas, Pacific and Ervay Sts., plans by Harrell & Hamilton, 819 Republic National Bank Bldg., Dallas, and Thomas, Jameson & Merrill, 920 N. Harwood, and Grayson Gill, Inc., 1913 San Jacinto Sts., Dallas, BANK and OFFICE ANNEX, St. Paul and Bryan Sts., $5,000,000. Bids mid-1962. CD 5/2/61.

▲ **Tex., Houston**—Siteman Organization, 7745 Carndlet St., St. Louis, Mo., plans by Wyatt C. Hedrick, constrct. engrs.-archts. 5201 Fannin St., 21 story OFFICE, incl. Phase I-11 story, $4,500,000; Phase II-ten story, $4,000,000. Holcombe Blvd. and Fannin St. Site Oil Co., 7745 Carndlet St., St. Louis, Mo., prime lessees. CD 8/16/60.

▲ **Tex., Houston**—Trans-Gulf, c/o George V. Lister, Jr., 3245 Ella Lee Lane, STORES and OFFICES, S. Post Oak and Westheimer, $12,500,000.

▲ **Wis., Milwaukee**—G-P-G-Corp., c/o R. Podell, 625 North Milwaukee St., plans by Hausner & Macsai, 104 South Michigan Ave., Chicago, Ill., 19 story, 180 unit APARTMENT. $3,500,000.

▲ **Que., Montreal**—University of Montreal, 299 Mount Royal Blvd., plans by Larose, Larose, Laliberte, Petrucci, 1255 Laird Blvd., Mount Royal, HOSPITAL, Guyard, Tremblay, Louis Colin and Decelles Ave. $20,000,000.

INDUSTRIAL BUILDINGS

▲ **Ala., Jackson**—Alabama Electric Coop., Inc., Montgomery Hy., Andalusia, STEAM GENERATING ELECTRIC PLANT, Over $10,000,000. Stanley Engineering Co., Hershey Bldg., Muscatine, Iowa, consult. engr.

▲ **La., Grand Isle**—Freeport Sulphur Co., Commerce Bldg., 821 Gravier St., New Orleans, 1,500 ft. PRODUCTION PLATFORM ADDN., man-made ISLAND, incl. 5 PLATFORM BRIDGES, 200 ft. long and one 50 ft. BRIDGE, 7 mi. from here. $3,500,000. Bids late December.

▲ **N. M., Lovington**—El Paso Natural Gas Co., Box 1492, El Paso, Tex., GAS PLANT and LINES, for 1962. $5,000,000.

PUERTO RICO

▲ **PUERTO RICO**—P. Wks. Dpt., Stop 22, San Juan, ROADS,
Aguadilla—0.47 mi. F-2(9&12), $1,200,000, Constr. January 1962.
Aguadilla-Anasco—1.27 mi. F 2-4(14), $3,020,000, Constr. March 1962.
Caguas-Humacao—2.24 mi. F 30-1(1), $2,000,000, Constr. March 1962.
Ensenada-Lajas—6.36 mi. S 116(3), $1,400,000, Constr. May 1962.
Hormiguerossan German—8.1 mi. F 2-5(6), $2,360,000, Constr. June 1962.

AMERICANS ABROAD

▲ **Jordan**—Planning Division, Development Bd., Amman, Jordan, WATER PROJECTS in Amman, Zerka, Ajloun, Irbed and Nablus. $3,000,000-$5,000,000. Brown Eng. Corp., 4100 Clinton Dr., Houston, Tex., U.S.A., consult. engr.

▲ **The Netherlands**—Crown-Van Gelder Papierfabakrieken N.V. (Crown Zeller ACH- AM G., Singel 236, Amsterdam, Swiss Subsidiary Crown Zellerbach Corp., 1 Bush St., San Francisco, Calif., U.S.A. and Royal Papermills Van Gelder Sons N.V., Amsterdam), 45,000-50,000 metric tons per year PAPER and PAPER BOARD MILL. $10,000,000.

LATIN AMERICA

▲ **Brazil**—Usinas Electricas do Paranapanema S.A. and Companhia Hidroelectrica do Rio Pardo, Sao Paulo, EXPAND DISTRIBUTION SYS. for generating electric power, State of Sao Paulo, northern Parana. $4,500,000.

FOREIGN

▲ **Israel, Tel Aviv**—Municipality of Tel Aviv, Tel Aviv, MUNICIPAL BLDG. $5,000,000.

▲ **Peru, Arequipa**—Corporation de Saneamiento de Arequipa, Arequipa, WATER and DRAINAGE FACILITIES EXPANSION, incl. 5 RESERVOIRS and WATER MAINS. $3,900,000. Bids soon.

▲ **Portugese, Timor**—Ministry for Overseas, Govt. Portugal, Lisbon, Portugal, DOCK, AIRPORT and WATER WORKS, Dili, Portugese Timor, Indonesia. $3,500,000.

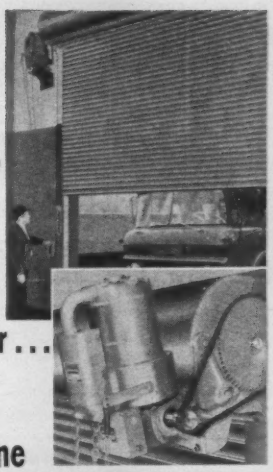
▲ **Sweden, Jordfallet**—Govt. Sweden, Stockholm, DRAWBRIDGE across Gota Alv, 700 meters long, 16.25 meters wide. $2,900,000-$3,900,000. Byggnadsavdelningen, Vagforvaltningen, Vanersborg, Sweden, consult. engr.

For additional reports see CONSTRUCTION DAILY NEWSLETTER

This is the door . . .

This is the motor operator . . .

This is the name



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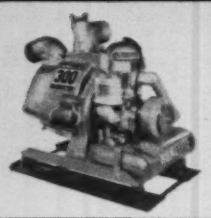

Size	Capacity	Wt. in lbs.	Model
	CENTRIFUGAL PUMPS		
1½"	5,500 g.p.h.	45	20S1½
2"	10,000 g.p.h.	69	35S2-1
2"	10,000 g.p.h. (slow speed)	69	35S2-1R
3"	18,000 g.p.h. (slow speed)	103	8S3-1
3"	18,000 g.p.h.	103	8S3-1R
3"	102 g.p.m. at 60 p.s.i. 250 g.p.m. — open discharge	103	8S3-1P
	DIAPHRAGM PUMP		
3"	5,000 g.p.h.	120	20DP3

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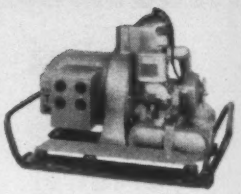
2 CYCLE ENGINE DRIVEN
CARRYABLE
GENERATORS



Capacity (Watts)	Current	Wt. in lbs.	Model
1,500	115 volt, 60 cycle, AC	90	35A115
3,000	115 volt, 60 cycle, AC	140	8A115
3,000	115/230 volt, 60 cycle, AC	141	8A115/230
3,000	230 volt, 180 cycle, 3-phase AC plus 110 volt DC	143	8HY

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Type	Head Dia.	Motor	Wt. (Complete)	Model
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Motor-in-head	2½"	High-Cycle*	41 lbs.	VH-10
Motor-in-head	4"	High-Cycle*	58 lbs.	VH-HD
Motor-in-head	2¾"	110 v. AC-DC	42	VU-MH
Flexible Shaft	1 1/16", 1¼", 1⅜"	110 v. AC-DC	41	MU-FS

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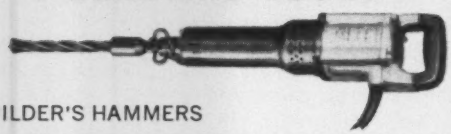
Model	Wt. in lbs. (Engine Only)	Type of Drive	Tree Sizes Model Will Cut (Dia.)	Straight Blade Bar Lengths
909G	26	Gear	up to 10'	19" to 60"
909D	23	Direct	up to 7'	17" to 42"
707G	21	Gear	up to 7'	16" to 60"
707D	19	Direct	up to 5'	14" to 30"
WIZ	20	Gear	up to 4'	16" to 28"
600D	18	Direct	up to 4'	14" to 30"
ZIP	18	Direct	up to 3'	14" to 25"
500	19	Direct	up to 3'	14" to 21"

ELECTRIC TOOLS



BUILDER'S HAMMERS

Weight	Capacity (Drill Sizes)	Motor	Model
13 lbs.	¼" to 1⅛"	115 volt AC-DC	BH-13-U
21 lbs.	½" to 2⅜"	115 volt AC-DC	BH-21-U
20 lbs.	½" to 2⅜"	High-Cycle*	BH-HC

PAVING BREAKER

Does all jobs that a 55-60 lb. air hammer will do. High-cycle motor. Weight: 60 lbs.

ROCK DRILL

Drills holes up to 3" in diameter, up to 20' deep. High-cycle motor. Weight: 55 lbs.

A complete line of accessories and tools are available from Homelite for the above builder's hammers, paving breakers, and rock drill.

*180 cycle, 230 volt, 3-phase AC power for high-cycle tools is supplied by carryable Homelite generator, Model 8HY.

HOMELITE
A textron DIVISION

1112 RIVERDALE AVE., PORT CHESTER, NEW YORK
WRITE FOR FREE FULL LINE CATALOG
IN CANADA: TERRY MACHINERY CO., LTD.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BUILDINGS—LB & CA

▲ **Green Manor Constr. Co., Inc.,** rr 382 Middle Turnpike West-Manchester, Conn., CA **$2,538,300,** SENIOR HIGH SCHOOL, WARWICK, R. I. City, School Bldg., Comn., School Admin. Bldg., 1849 Warwick Ave., Warwick, R. I. BA 11/5/61. CD 11/20/61, under LB.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **D. C., Wash.**—BA 12/12—K Street Assoc., c/o Bernard Frishman, archt., 1420 K St. N. W., Wash., 12 story OFFICE, 1428-30 K St. N. W., CD 6/1/61.

▲ **N. Y., New York**—BA 12/20—New York Medical College, 20 E. 106 St., Zone 29, 10 story, penthouse, LABORATORY asd MEDICAL COLLEGE, 26 E. 106 St. $3,750,000. Rogers & Butler, 219 E. 44 St., Zone 17, archts. Alexander P. Morgan, 32 E. 57 St., Zone 22, consult. archt. Syska & Henessey, Inc., 144 E. 39 St., Zone 16, mech. engr. Purdy & Henderson Assocs., 1 Madison Ave., Zone 10, struct. engrs. CD 10/11/61.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROADS,

N. Y.—S. J. Groves & Sons Co., 201 S. Main St. N., Syracuse, N. Y., CA **$3,776,417,** 9 in. c. conc. pavt. 4 brs. twin rein.-con. closed box, 5 hy. gr. seps. comp. 1-beam, 2 RR gr. seps. comp. plate girder Int. Rte. Conn. 580 Rochester Western Expressway (West Side Dr. to Buffalo Rd., Rochester Airport Expressway, Part 1 (FAI Conn. 580 to Chili Ave.), Chili Rd. Part 1, SH 254, Chili Rd. Part 2, SH 255, Rte. 490, FISH 61-15 FARAE 61-1 (FARC 61-83, Proj. I-IG 490-2(22); U-1103(3); U-231(18), Monroe Co.;

N. Y.—Peter Kiewit Sons' Co., P.O. Box 224, Eastwood Sta., Syracuse 6, N. Y., CA **$3,353,278,** 9 in. c. conc. pavt. 4.19 mi. (3.29 acc.) 2 hy. gr. seps. comp. plate girder, 4 hy. gr. seps. comp. beam, 2 RR gr. seps. comp. beam Int. Rte. 502, Saratoga Springs to Lake Elizabeth, Rte. 87, FISH 61-20, Proj. I-IG 87-3(47), Saratoga Co. BA 10/26. CD 10/27/61, under LB.

▲† **U. S. Eng.,** foot of Bridge St., Buffalo 7, N. Y., cancelled bids to have been opened Nov. 16, DEEPENING and MODIFICATION Rochester Harbor, Rochester, NEW YORK. **$2,000,000.** CD 10/10/61.

▲ **Lizza & Sons, Inc.,** 152 South St., Oyster Bay, N. Y., LB **$1,361,825,** (3 bidders), Contr. B-567-F, PAVING, CURBS, SIDEWALKS and DRAINAGE North Hempstead Turnpike from State Hy. 9018 easterly and southerly to 350 East of Main St. distance 4.600 ft, and Roslyn-West Shore Drive 1,900 ft. north from North Hempstead Turnpike, Roslyn, Town of Hempstead, MINEOLA, N. Y. Dpt. P. Wks Nassau Co., Old County Court House, Franklin Ave., Mineola, N. Y., BA 11/22, CD 10/31/61;

Hendrickson Bros., Inc., 63 No. Central Ave., Valley Stream, N. Y., LB **$2,177,101,** (2 bidders), Contr. 1144-B, constr. Lawson BLVD. from East Rockaway Rd. southerly and easterly to Long Beach Rd. and connection to Hampton Rd., Oceanside, Town of Hempstead, 10,800 ft. and BRIDGE over Long Island R.R. (Mineola, N. Y.).

▲ **Perini Corp.,** 73 Mt. Wayte Ave., Framingham, Mass. and **Morrison-Knudsen Co., Inc.,** 319 Broadway, Boise, Idaho, LB **$16,160,125,** (5 bidders), Proj. W-7, Contr. 500-Tunnel, WATER SUPPLY TUNNEL under Upper New York Bay, Richmond and Manhattan Boros, NEW YORK, N. Y. Bd. Water Supply, 120 Wall St., New York 5, N. Y. BA 11/28. CD 10/20/61.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 11/29, BRIDGE,

Phoenix Bridge Co., Phoenixville 1, Pa., LB **$2,382,970,** superstructure and deck of new Rte. 3 bridge over Hackensack River, Hudson and Bergen Counties. CD 11/8/61.

▲ **PENNSYLVANIA**—State Hy. Comn., 506 North Office Bldg., Harrisburg, ROAD,

H. J. Williams Co., Inc., 150 S. Sumner St., York, Pa., CA **$2,525,017,** (11 bidders), 42,723 ft. constr. divided hy. consisting rein.-con. pvt., 24 ft. also two bridges, L.R. 123(6-7), Adams and York Counties, BA 10/27/61. CD 11/1/61, under LB.

BUILDINGS—LB & CA

▲ **Depot Constr. Corp.,** 42-15 Crescent St., Long Island City 1, N. Y., CA Est. **$2,806,050,** 165 unit Nagle House APARTMENT, 112 acres northwest corner Nagle Ave. and West 204 St., NEW YORK, N. Y. Salvatore G. Schimenti 42-15 Crescent St., Long Island City 1, N. Y. A. A. Abdalian, 468 Park Ave. So., New York 16, N. Y., struct. engr. Mayer Assocs., 110 E. 30 St., New York 16, N. Y., mech. engrs. CD 9/28/61.

▲ **Herbert Constr. Co., Inc.,** 205 E. 85 St., New York 28, N. Y., CA Est. **$2,770,000,** 16 story, 64x187 ft., 147 unit Morris Heights APARTMENT, west side of Sedgwick Ave. near Tremont Ave., Bronx Boro, NEW YORK, N. Y. Samuel A. Whinston, 2830 Sedgwick Ave., New York, N. Y. CD 9/1/61.

▲ **Karab Constr. Corp.,** 158 Irving Pl., Woodmere, N. Y., CA Est. **$3,022,000.** 12 story, 160 unit Tivoli Terrace APARTMENT, 1.25 acres, east side Elder Ave. north of Bruckner Blvd., Bronx Boro, New York, N. Y. George B. Rabinor, 158 Irving Pl., Woodmere, N. Y. CD 5/8/61.

▲ **Metropolitan Equities, Inc.,** 158 Irving Pl., Woodmere, N. Y., CA Est. **$1,974,000,** 10 story, 38,000 sq. ft., 100 unit Oak Towers APARTMENT, east side Cruger Ave. between N. Oak Dr. and S. Oak Dr., NEW YORK, N. Y. George B. Rabinor, 158 Irving Pl., Woodmere, N. Y. CD 5/8/61.

▲ **Arnold Praver Assocs., 163-18 Jamaica Ave., Jamaica** 32, N. Y., Owner Builds, **$2,000,000,** 20 story, The Mayflower APARTMENT, northwest corner **1681-1689** Second Ave., NEW YORK, N. Y. Paul & Jarmul, 59 E. 54 St., New York 22, N. Y., archts. CD 2/3/61.

▲ **Mahony-Troast Constr. Co.,** 790 Bloomfield Ave., Clifton, N. J., CA **$4,812,122,** WEST WING HOSPITAL ADDN., ENGLEWOOD, N. J. Bd. Trustees Englewood Hospital, 350 Englewood Ave., Englewood, N. J. BA 11/21/61, CA 11/28/61. CD 11/28/61, under LB.

▲ **Irons & Reynolds, Inc.,** 420 Lexington Ave., New York 17, N. Y., LB **$2,920,000,** (7 bidders), 6 story, 120 bed HOSPITAL WING, Hospital Place, HACKENSACK, N. J. Hackensack Hospital Assn. of Hackensack General Hospital, 22 Hospital Pl., Hackensack, N. J. BA 11/28/61. CD 11/17/61.

▲ **Community Research & Development, Inc.,** 14 W. Saratoga St., Baltimore, Md., Owner Builds, **$2,000,000** Cherry Hill SHOPPING CENTER, Phase II, HADDONFIELD, N. J. Victor Gruen Assocs., 2 W. 13th St., New York, N. Y., archts. Kenneth C. Welch, 924 Grandview S.W., Grand Rapids, Mich., archt.

▲ **Robert J. Schmertz,** 230 First Ave., Lakewood, N. J. Owner Builds, **$2,500,000,** 125 ADDNL. HOUSES, County Line Rd. and Brookwood Parkway, JACKSON, N. J. Lester Cohen, 234 Clinton Pl., Hackensack, N. J., archt. Fellows & Read, 310 Main St., Toms River, N. J., engrs.

▲ **Lummus Co.,** 385 Madison Ave., New York 17, N. Y., CA design and construct THIBENZOLE MFG PLANT, RAHWAY, N. J. Merck & Co., Inc., 126 East Lincoln Ave., Rahway, N. J.

▲ **Claremont Developer,** c/o Leonard Blumberg, 203 South Main St., Manville, N. J., Owner Builds, **$6,000,000,** 200 HOUSES, Amwell Rd., First Section; **$750,000,** 25 HOUSES, Millstone River Rd., Hillsborough Township, SOMERVILLE, N. J. Herman York, 90-04 161 St., Jamaica, Zone 32, N. Y. and Herman Kuzel, 232 Walnut St., Dunellen, N. J., archts.

▲ **Griffith & Shedler,** 5 E. South Ave., Glenolden, Pa., CA Over **$2,000,000,** APARTMENT DEVELOPMENT (400 units), GLENOLDEN, PA. Green Tree Development Corp., 5 E. South Ave., Glenolden, Pa.

▲ **George A. Fuller Co.,** First National Bank Bldg., Pittsburgh, Pa., CA **$5,000,000,** OFFICE and UNDERGROUND PARKING FACILITIES, PITTSBURGH, PA. Equitable Life Assurance Society No. U.S., 3 Gateway Center, Pittsburgh, Pa. BA 10/31/61. CD 11/1/61.

▲ **Standard Constr. Co.,** 1000 Connecticut Ave. N.W., Wash., D. C., CA **$2,668,831,** OFFICE BLDG., 900 17th St. N.W., WASH., D. C. Judith Gerber, Inc., 1800 I St. N.W., Wash., D. C. BA 10/18/61. CD 10/20/61, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Kentucky**—BA About 1/10—U. S. Eng., P.O. Box 59, Louisville, Zone 1, Sect. I, RELOCATION U. S. HIGHWAY 31-E, Barren Reservoir, Barren Co., CIVENG-15-029-62-31 $2,000,000. Plans deposit $10. CD 10/3/61.

BUILDINGS—SLC

▲ **S. C., Charleston**—Roper Hospital, 310 Calhoun St., soon lets contract HOSPITAL ADDN. $2,500,000. Lockwood Greene Engineers, Inc., Montgomery Bldg., Spartanburg, archt. CD 11/20/61.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—State Hy. Dpt., 1221 East Broad, Richmond, ROADS,

Va.—Paul Slusher Co., 467 Lakewood Dr., Winter Park, Fla., **Lanford Bros. Co., Inc.,** Box 5127, Roanoke, Va., and **Sam Finley, Inc.,** Box 2389, Roanoke, Va., CA **$1,186,302,** grading, paving 3.33 mi. Interstate 64, along line existing US Rte. 69, from 0.56 mi. west to 3.98 mi. west of Clifton Forge, or approx. 1.5 mi. east of Island Ford at Jackson River, Alleghany Co.;

Va.—Bennie Snyder, P.O. Box 816, White Sulphur Springs, W. Va., CA **$1,797,423,** grading, drainage 3.79 mi. from 0.33 mi. north Botetourt County line to 4.12 mi. north county line, Rockbridge Co.;

Va.—Talbott-Marks Co., Inc., Box 308, Clarksville, Va. and **Robert A. Smith Co., Inc.,** Box 305, Farmville, Va., CA **$857,901,** grading, draining 2.54 mi. Interstate 81 from 4.2 mi. north Botetourt County line to Rte. 684 near Fancy Hill north of Natural Bridge, Rockbridge Co.;

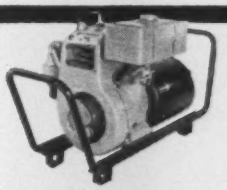
Va.—Oman Constr. Co., Inc., Box 146, Nashville, Tenn., CA **$1,191,058,** grading, draining 2.92 mi. Interstate 81 from Marion bypass 3.2 mi. east of Marion to point 4.8 mi. west of Wythe County Line, Smyth Co.;

Va.—R. G. Pope Constr. Co., Box 269, Bristol, Va., and **Oman Constr. Co., Inc.,** Box 146, Nashville, Tenn., CA **$2,417,968,** grading, paving and connections 4.86 mi. Interstate 81 from end of current project 0.39 mi. east of Rte. 80 near Meadowview to point 0.93 mi. east Rte. 91, near Glade Spring, Washington Co.

HOMELITE
4-CYCLE
ENGINE-DRIVEN
PUMPS AND GENERATORS

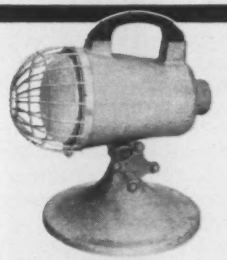
PUMPS

Size	Capacity	Wt.	Model
1½	7000	55	43S1½
2	9000	58	44S2
3	18000	95	45S3
3	4500	118	44DP3 (Diaphragm)



GENERATORS

Watts	Current	Wt.	Model
1500	115 Volt AC	104	46A115
3000	115 Volt AC	170	41A115
3000	115/230 Volts AC	170	41A115/230
5000 (Int.)			
4500 (Cont.)	115/230 Volts AC	250	42A115/230



Homelite Floodlights make night work easier and more efficient by flooding work area with brilliant lighting. Rugged cast-aluminum housings assure long service life. Quick release cable connectors make set up and break down easy — no tangled cables. Standard sealed-beam 300 or 500 watt floodlights or spotlights are used — no bulb replacement problems.

HOMELITE A textron DIVISION
1112 Riverdale Ave., Port Chester, New York
In Canada: TERRY MACHINERY CO. LTD.

Here's an Idea!

GAR-BRO helped cut costs in pouring concrete piers!

One contractor cut the time in placing concrete on this bridge job by planning ahead. Here, on these two bridge piers, note that he used three complete units comprised of Gar-Bro Collection Hopper and a string of Steel Chutes plus a Gar-Bro Bucket. He used the hopper and chutes to direct the concrete into the forms and prevent segregation.

His object was to prevent any delays by using one hopper and chute unit to place concrete in one pier, while the second one was set in place in the other pier, and the third one (see it hanging in rack between piers) was being shortened. Delays of transit mixers and the crane were minimized by rotating the hopper and chute units and shortening the chute line to the new level of the concrete in each pier.

It's a good idea to team up your Gar-Bro Concrete Handling Equipment to save time and cut costs.

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General Offices: 2415 E. Washington Blvd., Los Angeles 21, Calif.

GAR-BRO

The World's Most Complete Line of
CONCRETE HANDLING EQUIPMENT

Grand total $7,450,652. BA 11/15/61. CD 11/20/61, under LB.

▲ **MISSISSIPPI**—State Hy. Dpt., State Office Bldg., Jackson, ROADS,

Miss.—**M & W Constr. Co.**, Box 388, Tupelo, Miss., CA **$179,820**, gr., dr. culvert, box bridge and bridge 1.725 mi. Miss. Hy. 311 between Holly Springs and Mt. Pleasant. Proj. S-0917(5)A, Marshall Co.;

Miss.—**Dennis Bros., Contractors**, Box 10104, Jackson, Miss., CA **$183,625**, gr., dr., culvert, box bridge 5.615 mi. Miss. Hy. 413 between French Camp and Kilmichael, Proj. S-0720(3)A, Choctaw Co.; CA **$185,462** gr., dr., culvert 5.699 mi. Miss. Hy. 404 between Spring Hill and Bellefontaine, Proj. S-0715(5)A, Webster Co.;

Miss.—**Boyd Constr. Co.**, Box 822, Grenada, Miss., CA **$175,875** gr., dr., culvert 4.412 mi. Miss. Hy. 330 between Oakland and Coffeeville. Yalobusha Co.;

Miss.—**Bowyer & Johnson Constr. Co.**, Box 1508, Jackson, Miss., CA **$210,913**, gr., dr., culvert, 5.98 mi. Miss. Hy. 43 between Pickett and Pelahotchie. Proj. S-0428(6)A, Rankin Co.;

Miss.—**T. L. James & Co., Inc.**, Box 531, Ruston, La., CA **$1,760,288** gr., dr., b. conc. and c. conc. 6.173 mi. Interstate Hy. 55 between Glukstadt and Canton. Proj. I-55-2(30) III, Madison Co.;

Miss.—**Delta Constr. Co.**, Box 1066, Jackson, Miss., CA **$116,792**, gr., dr., culvert and box bridge 3.495 mi. Miss. Hy. 569 between Smithdale and Auburn. Proj. S-0167(6) A&S-0167(7)A, Amite and Lincoln Counties;

Miss.—**Madison Land Improvement Co.**, Canton, Miss., CA **$180,770**, gr., dr., culvert and box bridge 8.38 mi. Miss. Hy. 63 between Greene-Wayne County Line and Clara. Proj. S-0231(7) A, Wayne Co. Grand total $2,993,552. BA 11/21, CA 11/21. CD 11/6/61.

▲ **LOUISIANA**—State Dpt. Hys., Rm. 426, Headquarters Admin. Bldg., Baton Rouge, ROAD,

Boh Bros. Constr. Co., 2400 Cypress St., New Orleans, La., CA **$5,498,757**, c. conc. pavt. 0.936 mi. elevated expressway structure Baton Rouge Interstate Rtes. I-410 and I-10, SP Nos. 450-33-34 and 50-10-05 FAR Nos. I-41003(131)163 and I-10-3(14)156. East Baton Rouge Parish. BA 9/27, CA 10/10. CD 10/2/61, under LB.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, Bids opened 11/21, ROADS,

Ky.—**Wasson Coal Mining Corp.**, Box 192, Booneville, Ind., LB **$1,772,014**, (2 bidders), gr., dr., surf. 4.104 mi. West Kentucky Turnpike, WK 6-2-1, Grayson Co.; LB **$969,892** (2 bidders), grade, drain, surf. 3.54 mi. West Kentucky Turnpike, WK 6-2-2, Grayson Co.;

Ky.—**Wood & Bush Co.**, 418 Ann St., Frankfort, Ky., LB **$2,582,322**, (8 bidders), combination of Contr WK 6-2-1 and WK 6-2-2, Grayson Co. CD 11/6/61.

BUILDINGS—LB & CA

▲ **Robert H. Pinnix, Inc.**, Commercial Bldg., P.O. Box 97, Gastonia, N. C., LB **$2,089,920**, general contract TRAINING SCHOOL, Broughton State Hospital, MORGANTON, N. C. North Carolina Hospital Bd. Control, Revenue Bldg., Raleigh, N. C., BA 11/28/61, CD 11/21/61;

Albemarle Heating & Plumbing Co., 539 W. Main St., Albemarle, N. C., LB **$409,663**, heating and air-conditioning contract for TRAINING SCHOOL, Broughton State Hospital (Morganton, N. C.).

▲ **Batson-Cook Co.**, P.O. Box 4963, Jacksonville, Fla., CA Est. $2,000,000, APARTMENT, JACKSONVILLE, FLA. C. D. Spangler Constr. Co., 1028 S. Boulevard, Charlotte, N. C.

▲ **Frank J. Rooney, Inc.**, 5880 N.E. 4th Ave., Miami, Fla., CA Approx. $3,000,000, 227 units Point View APARTMENTS, S. Bayshore Dr., MIAMI, FLA. Paul Dennis, c/o Charles F. McKirahan, archt., 2400 E. Oakland Park Blvd., Fort Lauderdale, Fla. D. E. Britt & Assocs., 1766 Bay Rd., Miami Beach, Fla., engrs. CD 11/9/61.

▲† **Tennessee Valley Auth.**, New Sprankles Bldg., Knoxville, Tenn., Owner Builds, **$3,000,000**, 25,000 kilowatt rotating ELECTRIC PHOSPHOROUS FURNACE, Muscle Shoals, ALABAMA.

▲ **Hydrocarbon Research, Inc.**, 115 Broadway, New York 6, N. Y., CA Est. $2,500,000 PLANT to convert high-sulphur content oils to crude oil 2,50 bbls./day at existing refinery, LAKE CHARLES, LA. Cities Service Oil Co., 60 Wall St., New York 5, N. Y.

▲ **The Mall Shopping Center, Inc. (Community Research & Development, Inc.)**, 14 W. Saratoga St., Baltimore, Md., Owner Builds, **$3,000,000**, 44 unit SHOPPING CENTER, near LOUISVILLE, KY. Rogers, Tallalerro & Lamb, 411 N. Charles St., Baltimore, Md., archts. Kluckhorn & McDavid, 2430 Pennsylvania Ave., Wash., D. C., engrs. CD 1/27/61.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Ohio**—BA 12/6—U. S. Eng., foot of Bridge St., Buffalo 7, N. Y., DEEPENING CLEVELAND HARBOR to Seaway depths. $2,000,000. Advanced bid date. CD 10/31/61.

BUILDINGS—BA

▲ **Wis., Marshfield**—BA 12/11—Marshfield Water & Light Comn., Marshfield, Wildwood POWER STATION. Plans deposit $20. Benjamin Woodhouse & Guenther, Inc., 28 W. Adams Ave., Detroit 26, Mich., archt. CD 4/20/60.

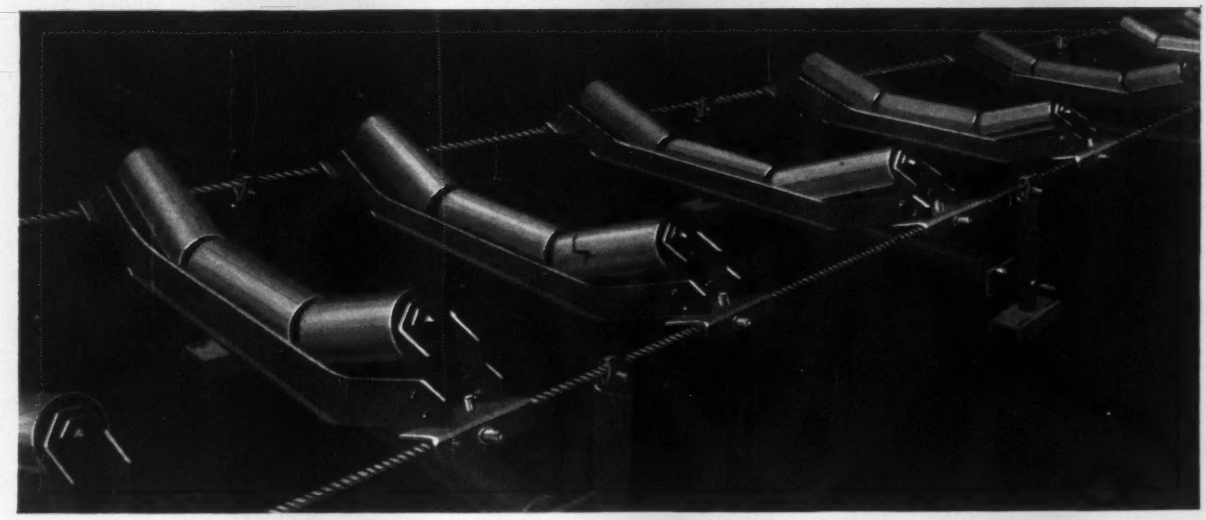
HEAVY CONSTRUCTION—LB & CA

▲ **Santucci Constr. Co.**, 5115 Church St., Skokie, Ill., LB **$2,628,076**, (5 bidders), Proj. 187, 144 in. diam. SEWER, S. Pennsylvania Ave. from 1,092 ft. north

(Continued on page 64)

LOW COST

H-R WIRE ROPE CONVEYORS



Standardized components for complete conveyor shipped quickly

You get tailor-made efficiency with minimum engineering at off-the-shelf prices with H-R wire rope conveyors. Modular design head and tail ends are compact, simply constructed. Erection time is decreased 66% and load carrying capacity is increased 13%, as compared with other conveyors.

See an H-R wire rope conveyor in operation . . . above or below ground. Contact your H-R field engineer or write Hewitt-Robins, Stamford, Connecticut to arrange an inspection tour.

SECRET OF H-R LOW COST:

Compactness, light weight, easy to handle, elimination of bulky structure, minimum storage required, reduced inventory investment.

Basic data on wire rope conveyors . . . Write for catalog 12-60

HEWITT-ROBINS

Conveyor Machinery and Belting • Power Transmission
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SPECIFY

Gary

WELDED STEEL GRATING

with the hexagonal cross bars

Tested and proved in millions of square feet! Used under all conditions, for open flooring and stair treads, Gary's hexagonal cross bar design and square edge strip assure a more durable, safer, neater grating. Pressure welded construction forms cross bars and main bars into a rugged one-piece grating. Tops of all bars are flush.

Pre-cut to your specifications. Whatever your needs in type and size, factory-fabricated Gary Grating saves you installation time and money. Careful quality control assures dimensional stability, long life and neat appearance.

Gary Grating can also be furnished in a variety of stainless steels and aluminum.

Specify Gary Grating . . . either in steel or aluminum . . . for all your functional and decorative grating and stair tread requirements. Write today for free catalog – Dept. L-17, 4045 E. Seventh Ave., Gary, Indiana.

ROCKWELL-STANDARD CORPORATION

Grating Division, Gary, Indiana

(Continued from page 62)

of E. Rawson Ave. to E. College Ave., Oak Creek, MILWAUKEE, WIS. Metropolitan Sewerage Comn. of the County of Milwaukee, P.O. Box 2079, Milwaukee, Wis., BA 11/28/61. CD 11/8/61;

W. J. Lazynski, Inc., 4445 North 124 St., Milwaukee, Wis., LB **$1,049,704**, (8 bidders), **Proj. 188**, 84 in. diam. SEWER, S. Pennsylvania Ave. from E. Puetz Rd. to 1,146 ft. north E. Ryan Rd., (Milwaukee, Wis.).

▲ **MICHIGAN**—State Hy. Dpt., Civic Center, Lansing, Bids opened 11/21, ROADS,

Mich.—**Smith Bros. Excavating, Inc.**, Cassopolis, Mich., LB **$2,248,734**, est. $2,450,000, (16 bidders), 9 in. concrete pavt. 6.108 mi. and 12 bridge structures US-131 (Reloc.) from existing US-131 northerly to "O" Ave., Proj. 7, Kalamazoo Co.;

Mich.—**Charles J. Rogers, Inc.**, 14836 Grand River Ave., Detroit 27, Mich., **Cooke Contracting Co.**, 1116 Penobscot Bldg., Detroit 26, Mich., and **Jutton-Kelly Co.**, 13240 Albert Ave., Dearborn, Mich., LB **$1,492,072**, est. $1,710,000, (5 bidders), 0.4 mi. alterations to Edsel Ford Expressway, 3 interchange bridge structures and partial constr. of two other interchange bridges on I-75 at Interchange with Chrysler Expressway in City of Detroit, Proj. I-75-1(43)53, Wayne Co.;

Mich.—**Charles J. Rogers, Inc.**, 14836 Grand River Ave., Detroit 27, Mich. and **Cooke Contracting Co.**, 1116 Penobscot Bldg., Detroit 26, Mich., LB **$555,982**, est. $620,000, (6 bidders), grading, concrete surf., water mains and sewer alterations 2.203 mi. northeast service road of Northwestern Hy. from Lee Baker Rd. to Lahser Rd. in City of Southfield, Oakland Co. CD 11/7/61.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing 26, ROADS,

Mich.—**Gilliland Constr. Co.**, Box 517, Alpena, Mich., CA **$2,404,433**, 5.787 mi. Int. 75 freeway and three bridges FAS Rte. 1052 in Mackinac City north to 2 mi. north of M-48 in Chippewa, Mackinac and Chippewa Counties;

Mich.—**Bacco Constr. Co.**, U.S. 2, Iron Mountain, Mich., CA **$1,067,991**, 4.694 mi. grading, aggreg. base U.S. 2 from Howell St. in Bessemer east to point in Wakefield, Gogebic Co. BA 11/8. CA 11/21. CD 11/14/61, under LB.

BUILDINGS—LB & CA

▲ **Bob Schmitt Homes**, P.O. Box 167, Beree, O., Owner Builds, **$2,000,000**, $1,000,000 first year (2 year program), 102 Blue Grass Manor HOMES, BEREA, O.

▲ **Virginia Homes, Inc.**, 339 S. James Rd. and **Highlander Homes**, 1093 Frank Rd., both of Columbus, O., Owner Builds, **$4,000,000**, 200 Heritage HOMES, south of Rte. 62, GAHANNA, O. CD 1/12/61.

▲ **Gault Village, Inc.**, 8614 Willow Rd., Ypsilanti, Mich., Owner Builds, **$1,300,000**, 130,000 sq. ft. SHOPPING CENTER, 1,400-car parking facilities east of S. Grove Rd. and south of Int. 94 freeway, YPSILANTI, MICH. Trefon Sagadenky Cuyahoga Falls O. archt.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲ **Tex., Brady**—BA 12/19—Mayor R. M. Priesmeyer, Contracting Office, City of Brady, Brady County Club, constr. Brady Creek DAM. $2,335,000. Plans deposit $25. Freese, Nichols & Endress, 407 Danciger Bldg., Fort Worth, engrs. CD 1/3/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Mitchell Constr. Co.**, 301 W. 53rd St., N., Wichita, Kan. CA Est. **$1,980,000**, 90 mi. 8 in. 20,000 bbl. daily cap. PRODUCTS LINE, Oklahoma City to Temple, OKLAHOMA Cherokee Pipeline Co., (Continental Oil Co. and Cities Service Pipeline Co. P.O. Box 2197, Houston, Tex.) Ponca City, Okla. CD 11/16/61.

▲ **Bi-Stone Fuel Co.**, 1st National Bank Bldg., Corsicana, Tex., CA **$3,150,000**, 100 mi. 16 in. MAIN GAS LINE, bet. Merit and Bethel; CA **$685,000**, 75 mi. 1,6 and 8 in. GAS LINE LATERALS, running north and northwest of Merit; CA **$450,000**, 30 mi. 10 in. GAS LINE, Merit to McKinney, and Denton areas; CA **$455,000**, 30 mi. 10 in. GAS LINE, Merit to Savoy, TEXAS. Texas Power & Light Co., Fidelity Union Life Bldg., Dallas, Tex. Grand total $4,740,000.

▲ **COLORADO**—State Hy. Dpt., 4201 East Arkansas Ave., Denver, ROAD,

A. S. Horner Constr. Co., 2810 South Havana, Denver, Colo., CA **$1,923,967**, grading, structures, conc. paving approx. 0.621 mi. East 46th Ave., between Lincoln St. and Downing St., Colorado Proj. I 70-4 (16) 285, Denver Co., BA 11/21/61, CA 11/21/61. CD 11/24/61, under LB.

BUILDINGS—LB & CA

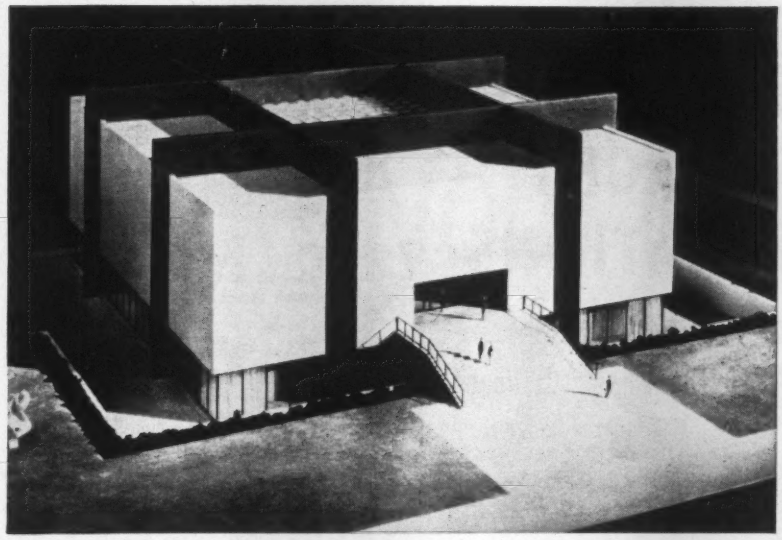
▲ **Thad Dederick Constr. Co.**, P.O. Box 13067 (River Oaks Station), Houston, Tex., CA **$3,070,000**, BANK, BEAUMONT, TEX. First National Bank, 495 Orleans St., Beaumont, Tex. BA 10/4/61. CD 9/26/61.

▲ **J. E. Morgan & Sons**, P.O. Box 6029, Dallas 22, Tex., CA **$2,140,500**, 2 story, bsmnt., 62,000 sq. ft., masonry, steel frame OFFICE, Mockingbird Lane, Hine Blvd. and Treadway St., DALLAS, TEX. Great National Life Insurance Co., 1604 Main St., Dallas, Tex. BA 11/8/61. CD 11/20/61, under LB.

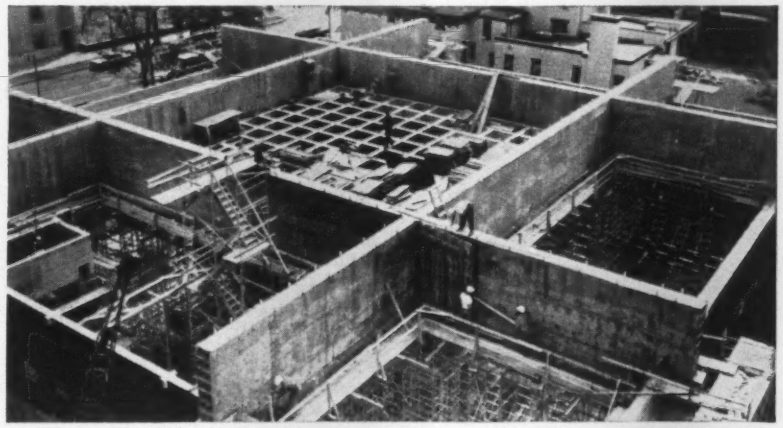
▲ **John Pullen, Builder**, 524 Parkhurst St., Box 18416, Dallas, Tex., Owner Builds, **$3,000,000**, one hundred fifty 1 and 2 story, brick veneer DWELLINGS, PLANO, TEX.

▲ **Johnson, Drake & Piper, Inc.**, and **H. A. Lott, Inc.**, 2244 West Holcombe Blvd., Houston, Tex., LB **$6,990,000**, (12 bidders), HOSPITAL and CLINIC, TEMPLE, TEX. Scott-White Memorial Hospital, W Ave. F, Temple, Tex. BA 11/28/61. CD 10/23/61.

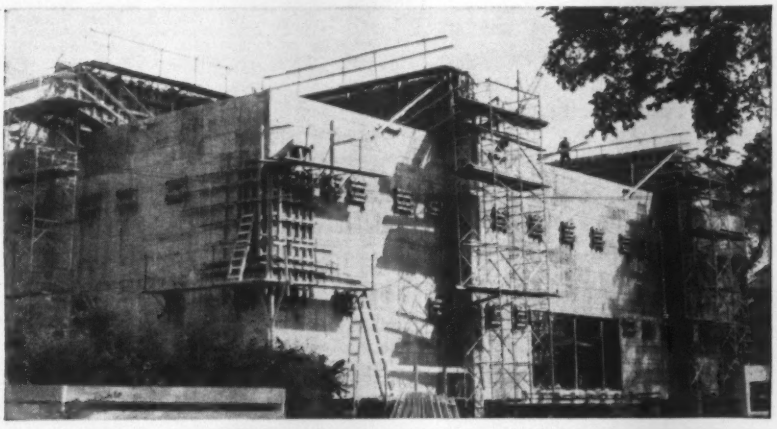
(Continued on page 66)



INVERTED-T's, 129″ deep with 22″ webs and 34″ flanges, form two-way lattice roof girder system for Munson-Williams Proctor Institute, Utica, N. Y Girders were post-tensioned after two weeks, when concrete had reached 4,000 psi. Each girder carries 14 tendons, each composed of 25 ¼″-dia. wires.



12 CAST-IN-PLACE 50″ ribs form coffer in 57 sq. ft. central bay. Plexiglass domes will admit natural light to gallery. This section was cast monolithically with the roof girders. Girder mix weighed 144 lb. per cu. ft. The rest of the superstructure was formed with lightweight concrete, 110 lb. per cu. ft.



EXTERIOR WALL-GIRDERS, 31′ deep and 11″ thick, are supported on columns. They cantilever 30′ beyond the columns to corners. Contractor, George A. Fuller Co.; Consulting engineer, Lev Zetlin; Architect, Philip Johnson Associates, all of New York City.

Concrete control is key to unique roof girder system

SPECIALLY DESIGNED ready mixed concrete, poured monolithically over 16 hours, was the key to the ingenious roof girder system of this column-free art gallery. Four interlocking, inverted-T roof girders support both the 117 sq. ft. roof area and a 30′ wide balcony, hung 18′ below. 31′ deep concrete wall-girders cantilever 30′ beyond eight exterior columns to provide exterior support for roof, balcony and main floor framing.

The 350 cu. yd. continuous pour, specified to avoid construction joints, called for a special concrete mix that would reach 5,000 psi at 28 days, have slow initial set, good workability and rapid development of creep. Another requirement was slump variation from 3½″ to 2½″ to assure uniform setting.

Shrinkage cracks were controlled by leaving open 3′ x 20′ diagonal strips at the corner of each floor and 3′ wide corner sections in the walls. These were poured two months later, after most shrinkage had occurred.

From 8 a.m. until midnight, 22 cu. yd. of precisely mixed concrete were delivered each hour by truck mixers of certified design, capacity, mixing speed and water control accuracy.

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Concrete Transport Mixer Company
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Construction Machinery Company
Waterloo, Iowa
Hercules Galion Products, Inc.
Galion, Ohio
The Jaeger Machine Company
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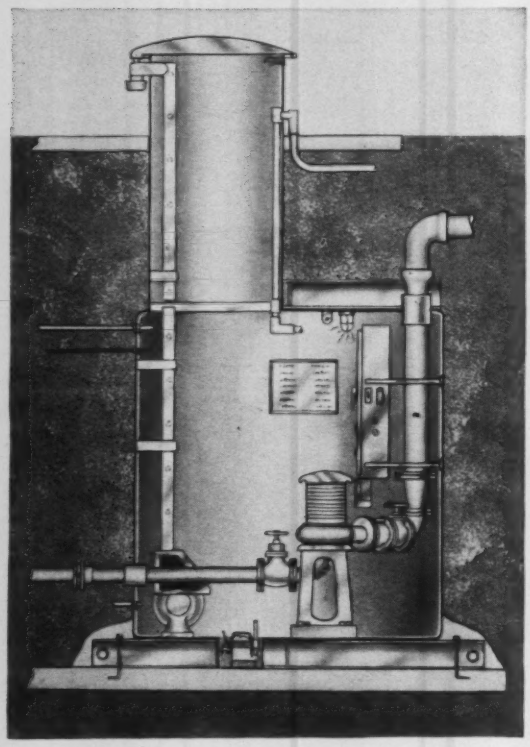

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(Continued from page 64)

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲† **Vinnell Corp.**, 1145 Westminster Ave., Alhambra, Calif., LB **$3,466,000**, est. $3,244,637, (9 bidders), EARTHWORK, concrete DIVERSION DAM, Sacramento Canals Unit, Sacramento River Div., Central Valley Proj. near Red Bluff, Tehama Co., Spec. No. DC 5687, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Petersen Bldg., 238 South Main St., Red Bluff, Calif. BA 11/28. CD 10/23/61.

▲ **R. A. Wattson Co.**, 12550 Saticoy St., North Hollywood, Calif., CA **$1,943,017**, Proj. 474, Lindley Ave. STORM DRAIN, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 11/10, CA 11/21. CD 11/17/61, under LB.

BUILDINGS—LB & CA

▲ **Lewis & Clark College**, 0615 SW Palatine Hill Rd., Portland, Ore., cancelled bids to have been opened Nov. 29, DORMITORY, PORTLAND, ORE. Stanton, Boles, Maguire & Church, 208 SW Stark St., Portland, Ore., archts. CD 11/3/61.

▲ **Ten Construction Companies**, 6053 Atlantic Ave., Long Beach, Calif., LB **$2,037,000**, (4 bidders), BRANCH CONSERVATION CENTER, incl. 19 Type V Bldgs., Dpt. Corrections, W.O. AB10 015 C, CHINO, CALIF. State Div. Architecture, 107 South Broadway, Los Angeles, Calif. BA 11/22. CD 10/30/61.

▲ **Peter Kiewit Sons Co.**, 345 Kieways Ave., P.O. Box 748, Arcadia, Calif., LB **$16,836,937**, (4 bidders), constr. MUSIC CENTER, LOS ANGELES, CALIF. Music Center Lease Co., c/o Bd. Supervs. Los Angeles Co., 500 W. Temple St., Los Angeles, Calif. BA 11/28. CD 11/24/61.

▲ **Pacific Coast Builders**, 1 South Park, San Francisco, Calif., LB **$1,980,000**, (7 bidders), CAL 3-11 & CAL 3-88, Lockwood Annex LOW RENT HOUSING between 66 and 69 Aves., OAKLAND, CALIF. City Housing Auth., 935 Union St., Oakland, Calif. Confer, Willis, Anderson, Warnecke & Warnecke, Treichel & Gibbs, 366 40 St., Oakland, Calif., archts. Frank McClure, 1444 Webster St., Oakland, Calif., engr. CD 12/19/51.

▲ **Rossmoor Leisure World**, 3801 Los Alamitos Blvd., Seal Beach, Calif., CA **$5,733,000**, 18 stucco, brick APARTMENTS, St. Andrews Dr., Annadale Dr., Thunderbird Dr., Burning Tree Lane, Church Pl., Tract 4337, SEAL BEACH, CALIF. Seal Beach Mutual No. 1, 3801 Los Alamitos Blvd., Seal Beach, Calif.

CANADA

BUILDINGS—BA

▲ **Ont., Toronto**—BA 12/19—Bd. Educ., 155 College St., 2 story, bsmnt., precast concrete panels with exposed aggregate, brick, structural steel frame, CENTRAL HIGH SCHOOL ADDN. $1,905,000. Plans deposit $50. Page & Steele, 72 St. Clair Ave. W., archts., Seto, Shienfield & Assocs., 974 Eglinton Ave. W., engrs. CD 9/26/61.

BUILDINGS—LB & CA

▲ **Sillman Co., Ltd.**, 814 Macdonnell St., Port Arthur, Ont., CA **$2,117,388**, (7 bidders), VOCATIONAL HIGH SCHOOL, Clarkson Ave., PORT ARTHUR, ONT. Port Arthur Bd. Educ., Port Arthur, Ont. BA 11/14/61. CD 11/10/61.

PUERTO RICO

BUILDINGS—BA

▲ **Puerto Rico, Santurce**—Enterprise Development Corp., San Juan Bank Bldg., San Juan, soon lets contract 24 story, 400-room rein.-con. SHERATON HOTEL. CD 5/20/59.

U.S. POSSESSIONS

BUILDINGS—LB & CA

▲† **H. A. Lott, Inc.**, Box 25005, Houston, Tex., and **Johnson, Drake & Piper, Inc.**, Box 20036, Houston, Tex., CA **$2,225,000**, replacement U. S. COMMUNITY HOUSING, Pacific Side Canal Zone, Proj. PC-62-11, BALBOA HEIGHTS, PANAMA. Panama Canal Co., 21 West St., New York 6, N. Y. BA 11/1. CD 11/20/61, under LB.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **ARGENTINA**—BA 1/15—Direcc. Nacional Vialidad, Av. Maipu 3, Buenos Aires, ROAD, 78.50180 kilometers basic work and riprapping Rte. 90, Sections Margarita Belen-General San Martin, Province of Chaco. CD 9/12/61.

▲ **ARGENTINA**—BA 1/22—Direcc. Nacional Vialidad, Av. Maipu 3, Buenos Aires, ROAD, basic work and paving Rte. 12, Corrientes Province. CD 11/21/61.

FOREIGN

HEAVY CONSTRUCTION—LB & CA

▲ **Bin La-En of Jeddah**, Saudi Arabia; **Mi-Rubini Co.**, Osaka, Japan and **Ferrovial** of Spain, CA Est. **$25,000,000**, rehab. RAILWAY LINE between Ma'an (Jordan) and Madina Al-Munawara (Saudi Arabia) 503 mi., JORDAN and SAUDI ARABIA. Executive Committee for Recommissioning Hedjaz Railway Line, P.O. Box 134, Damascus, Syria. CD 4/6/61.

For additional reports see CONSTRUCTION DAILY, REPORTS SECTION

(Proposal Advertisements see pp. 80 to 82)

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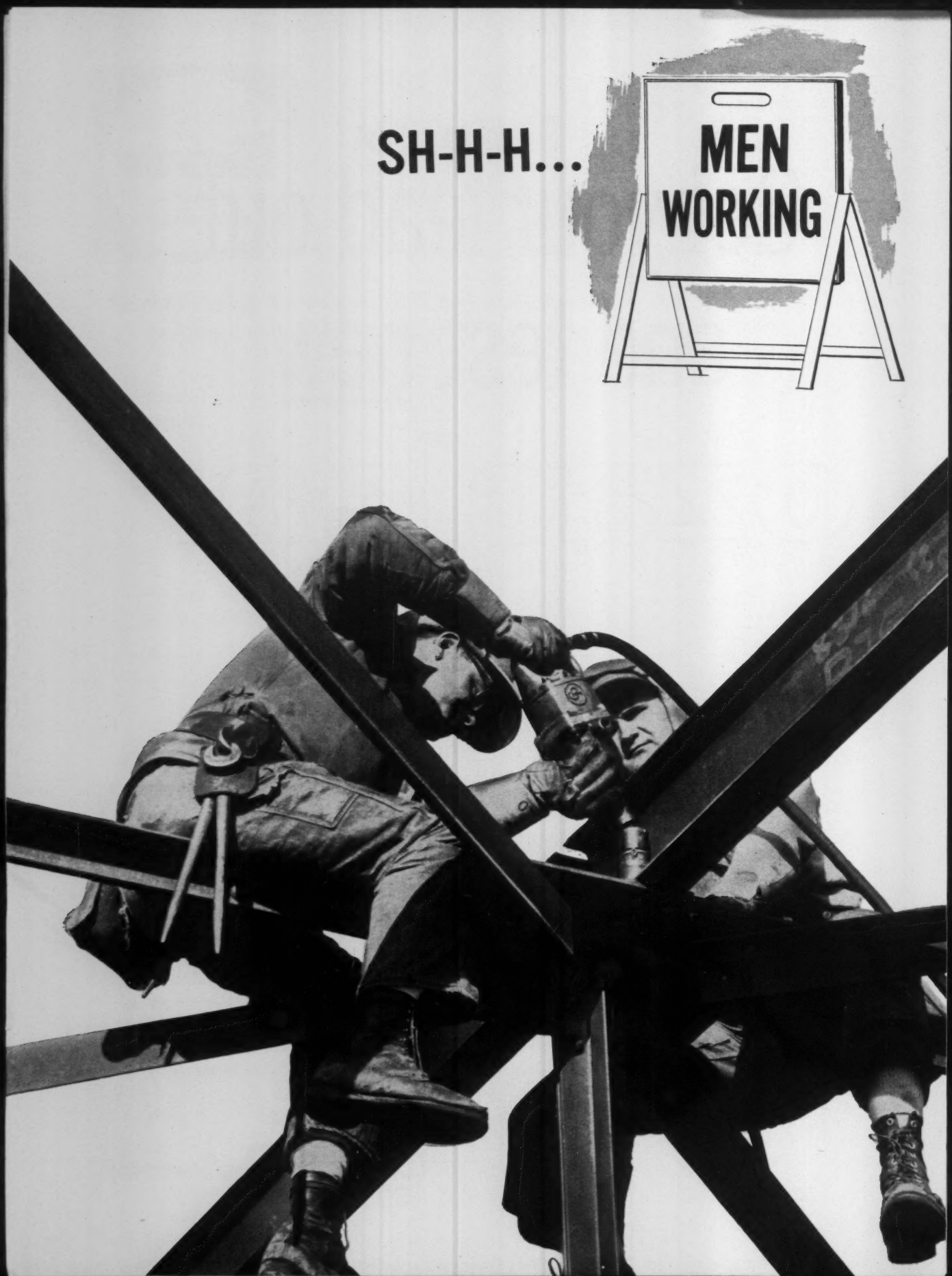
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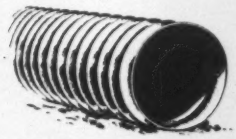
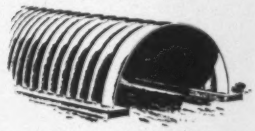
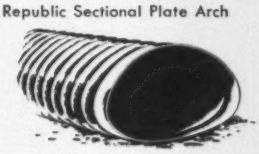


Republic Corrugated Metal Pipe and Sectional Plate Pipe



Republic Sectional Plate Arch



Republic Corrugated Metal Pipe-Arch and Sectional Plate Pipe-Arch

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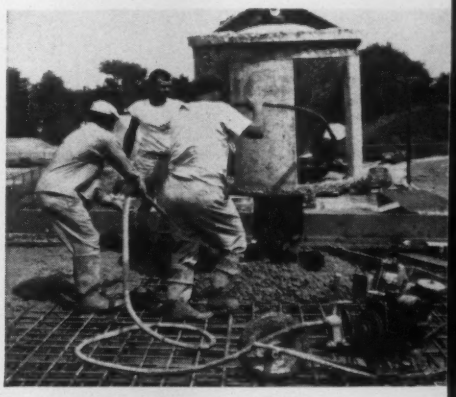

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This attractive bridge carries New Hampshire Route 3B over Interstate Highway 93 in the town of Northfield, New Hampshire. When completed last fall, the bridge was given, in addition to the shop coat, two coats of paint containing *M50* Basic Lead Silico Chromate—the remarkable pigment that not only offers top-notch primer protection in every coat, but also a range of tinting possibilities never before available in outdoor protective paints. Bright hues, soft pastels, matched "official" colors . . . *M50* Basic Lead Silico Chromate can be tinted to meet virtually any color requirement while providing anti-corrosion protection all the way out from primer to finish and outstanding durability all the way in from finish to primer. Weather resistance is outstanding.

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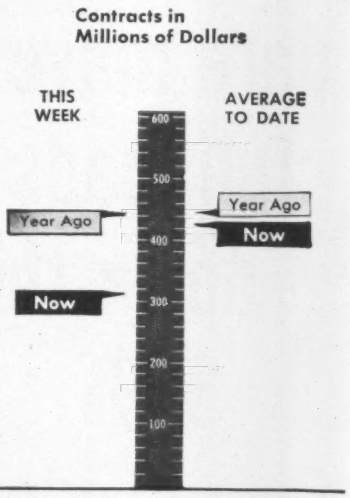
Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

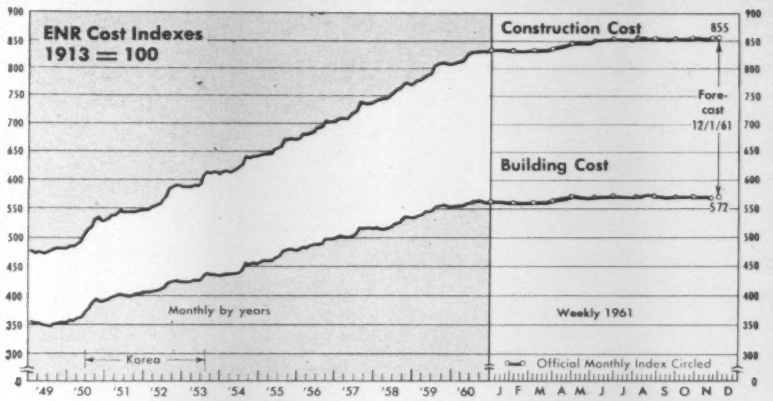
Contracts Awarded In 50 States By Type	This Week	Cum. 49 wks 1961 millions	Chge '60-'61 %
All Heavy Construction	$316.9	$20,946.6	— 3
By Ownership			
PRIVATE	189.5	10,415.9	— 9
PUBLIC	127.4	10,530.7	+ 3
State & Municipal	107.0	8,338.0	+ 5
Federal	20.4	2,192.7	— 4
By Type of Work			
PUBLIC			
Waterworks	5.6	390.5	—11
Sewerage	15.9	772.8	+35
Bridges*	3.0	627.7	—17
Highways	32.2	3,531.9	+ 9
Earthwork, Dams & Waterways	6.9	767.9	+ 7
Buildings:			
Excl. Housing	44.9	2,499.6	+ 3
Housing	8.9	763.9	+13
Unclassified	10.2	1,177.7	—14
PRIVATE			
Buildings:			
Mass Housing	80.5	4,838.2	—10
Commercial	63.3	2,471.9	+ 1
Industrial	38.7	2,683.1	+ 1
Unclassified	6.8	421.4	—57

* Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Nov. 30	Cum. 48 wks 1961 millions	Chge '60-'61 %
Corporate Securities	$59.5	$3,340.8	— 4
State & Municipal:			
All Except Housing	86.3	6,380.0	+ 8
Housing	0	126.6	—41
Federal Loans	1.1	229.4	+32
Federal Aid	0	3,535.7	+10
Total Nonfederal	$146.9	$13,612.5	+ 5
Federal Appropriations:			
Projects in U. S.	0	$3,448.1	+ 9
Outside U. S.	0	145.4	— 9
Total New Capital	$146.9	$17,205.9	+ 5


ENR Cost Indexes
1913 = 100
Construction Cost
855
Fore-cast 12/1/61
Building Cost
572
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
'49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60 J F M A M J J A S O N D

ENR INDEXES (1913=100), 20-cities' average	Week of Nov 30 1961	% Change from Nov. 2 1961	% Change from Dec. 1 1960
Construction Cost	854.97*	—0.1	+3.0
Building Cost	570.39*	—0.1	+1.6

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

This Month . . .

WAGE RATES, 20-cities' average	Nov. 1961	% Change from Oct. 1961	% Change from Nov. 1960
Common	$2.877	+0.2	+4.8
Skilled (average 3 trades)	4.253	+0.2	+3.8
Bricklayers	4.445	+0.04	+3.1
Structural Ironworkers	4.324	+0.2	+4.3
Carpenters	3.990	+0.2	+4.1
Equipment operators (average three types)	3.906	+0.5	+4.8
MATERIAL PRICES, 20-cities' average			
Structural Steel (average 3 mills), per cwt	5.50	0	0
Lumber, 2x4 Fir, per M fbm	114.68	—0.7	—1.1
Lumber, 2x4 Pine, per M fbm	106.67	—0.1	—1.6
Cement, bulk, per bbl	4.02	0	0
Sand, per ton	2.321	+0.3	—1.8
Ready-mixed concrete, per cu yd	14.25	+0.3	—0.2
Gypsum sheathing, ½″x2′x8′, per Msf*	61.65	+0.2	—1.4
Fiber board sheathing, ½″ sq. ed., per Msf*	71.09	+0.4	+0.6
Mineral wool insulation, 3′ batts, per Msf*	66.52	0	—2.4
Crushed stone, 1½″, per ton, CL	2.415	0	—8.8
Concrete blocks, sand/gravel, 8″x8″x16″, each*	2.267	+0.4	—0.8

Latest Month . . .

	Nov. 1961	Oct. 1961	Nov. 1960
Brick, common per M	41.28	0	+0.8
Lime, hydrated finishing, per ton, CL	39.57	+0.7	+1.8
Structural clay tile, 3x12x12″, per M, 2,000 up*	193.15	—0.2	+2.2
Vitrified clay sewer pipe, std 12″, per ft	1.463	+0.3	+4.3
Concrete sewer pipe, 12″, per ft	1.426	—1.8	+0.5

* Delivered, trucklots

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
1960	**1913—100**	**1949—100**	**1913—100**	**1949—100**	**1913—100**	**1949—100**
Sept.	830.92	174.19	562.79	159.98	603	174
Oct.	829.58	173.90	561.45	159.60	591	171
Nov.	830.09	174.01	561.11	159.50	609	176
Dec.	830.61	174.12	561.50	159.61	503	145
1960 Average	**823.55**	**172.64**	**559.43**	**159.02**	**597**	**172**
1961						
Jan.	834.32	174.90	562.91	160.01	557	161
Feb.	834.27	174.89	562.93	160.02	464	134
Mar.	834.16	174.87	562.89	160.01	519	150
Apr.	837.58*	175.58*	565.19*	160.66*	598*	173*
May	847.32*	177.62*	568.99*	161.74*	609*	176*
June	850.38*	178.28*	570.17*	162.07*	634*	183*
July	853.64*	178.95*	571.66*	162.50*	609*	176*
Aug.	854.09*	179.05*	570.86*	162.27*	587*	170*
Sept.	854.01*	179.03*	571.34*	162.40*	549*	159*
Oct.	854.48*	179.72*	570.55*	162.18*	628*	182*
Nov.	854.97*	179.23*	570.39*	162.14*	552*	160*

* Subject to adjustment due to retroactive wage increases.

"Only Payhaulers dare move full loads down this 38% grade!"

Exclusive Torqmatic brake lets International Payhaulers speed full 27-ton loads down the mountain —a dangerous trip in any other rig. Early in the job, when this steep grade was too much for other haulers, six 95's kept production going. This is the toughest section of Slate, Hall & Hamilton's $8,000,000 roadbuilding contract.

Other rigs sit idle while "95" Payhauler units move 27-ton loads down mile-long haul road...

Slate, Hall & Hamilton of Portland are building 4-lane US Route 5 through Oregon's rugged coastal range. Contract calls for moving 4,800,000 cu. yds. of 20% rock material. Toughest part of the job is 330-ft. cut through high rocky outcrop above the Sacramento River. Existing Route 99 and main line of Southern Pacific Railroad—both kept open—run between the job and the river. Haul roads, crowded against the cliff, are steep and narrow, with hairpin curves.

"I wish we had more Payhaulers on this hill," says Owner E. D. Slate. "They took out full loads on a mile-long road with a 38% grade where we didn't dare put other trucks. Even after we cut the maximum grade to 28% other rigs only carry half a load. Thanks to that Torqmatic brake, we're getting full production from the Payhaulers!"

Downgrade hauling stability is built right into the Payhauler. Positive Torqmatic braking, standard equipment on the 95, gives the operator confidence to use best haul speeds, even on the steepest grade with a full load. Fingertip power steering and convenient brake control lever further increase operator ease and safety—add up to extra haul cycles on every job. Prove to yourself how the 27-ton 95 or the 19-ton 65 will boost production on your spread. Call your International Construction Equipment Distributor and arrange for a Payhauler demonstration today!

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Federal Work Slows to a Walk

Despite a big jump in the amount of money made available for construction spending by the last Congress, federal contract awards compare most unfavorably with last year. Over the longer term—1958 to 1960 inclusive—the rate of federal construction contracting also shows weakness (see chart).

Volume of federal work continued sagging in November, with the weekly average rate falling to $28 million. In October, the rate dragged along at $30 million a week.

On a cumulative basis, contract volume in the first 11 months totaled $2,172 million compared to $2,162 million last year. But as this year's January-November period contained 48 weeks compared to 47 weeks in the same period last year, awards are down 2% on an average basis.

Moreover, in the July through November period—the first five months of the federal fiscal year—contract volume shows a drop of 4% from the corresponding months of the 1961 federal fiscal year.

Congress, however, boosted appropriations for construction in the 1962 fiscal year by slightly more than 20%, from $7.9 billion in fiscal 1961 to $9.5 billion in the current fiscal year which started July 1.

Although Congress voted the funds relatively late in the session, it logically could be expected that contracts would show some recovery by this time. Well before the end of October, the funds had been apportioned among the various agencies, both military and civil.

So in the face of generally fatter apportionments among contracting agencies, contracts failed to rally last month as they did in both November 1959 and November 1960. Instead they fell back almost to the November pace of 1955-58, which saw federal work fluctuating within the narrow range of $24 million to $27 million per week.

Federal agencies must grind out their contracts at a furious pace this month, if the volume of recent years is to be maintained. A continuation of the sliding trend would probably result in the lowest dollar volume of federal contracts since 1957.

A smaller volume of missile base construction probably contributed to the largest part of 1961's decline, but not to the longer-term drop since 1958-59.

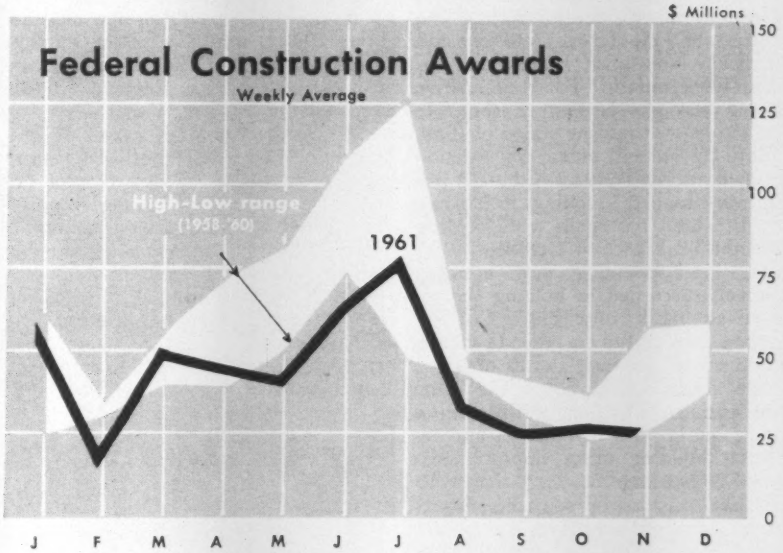
Although missile base contracts reported by ENR show a 14% decline from 1960 in the first 10 months, the total this year stands far above 1958 and 1959.

The phasing out of Capehart housing and a sharp fall-off in awards for military airbases other than missile launching facilities also contribute to the decline for 1958 and 1959.

On a shorter-range basis, it appears that the Administration intends to apply its recent economy order to construction. An estimated deficit of $6.9 billion faces the Administration, which knows only too well that it could go higher than that unless all agencies clamp down.

At the moment, federal spokesmen appear reluctant to give reasons for the obvious slowdown or indicate what direction construction contracting will take in the coming months. To ENR they generally cited the late appropriation action of Congress and the resulting delay in apportionment of these funds.

The drop in volume hit the regions in varying degrees, New England showing the largest drop—49%—in the first 11 months. The South, Midwest and Mississippi-to-the-Rockies scored gains ranging from 9% to 33% (see table).



FOUR-YEAR LOW LOOMS for federal construction market.

Regional Impact

(Millions of Dollars)

Region	Eleven Months '61	Eleven Months '60	% Chg.[d]	Annual Totals '60	Annual Totals '59[c]	Annual Totals '58
U. S. Total—50 states[a]	2,172	2,162	— 2	2,457	2,832	2,826
New England	64	124	—49	133	95	177
Middle Atlantic	220	248	—13	289	244	320
South	498	446	+ 9	491	635	621
Midwest	159	121	+29	134	288	293
Miss. R. to Rockies	789	583	+33	703	805	789
Far West[b]	442	640	—32	707	764	626

[a] 48 states in '58. [b] Includes Alaska and Hawaii from 1959-61.
[c] 53-week year. [d] % change based on weekly average; 48 in '61, 47 in '60.
Data: ENR

DECLINE STRIKES HARD at New England, Middle Atlantic and Far West.

Contract Volume Continues to Fall

The rate of heavy construction contracting slowed in November. Awards totaling $2.1 billion went to contractors in the five-week month, pulling the weekly rate 11% below October's and 7% below November, 1960. Each was a four-week month. Total cumulative volume through November therefore falls 3% below the same period of 1960.

Both private and public construction declined in November. Although private work topped $1 billion in November, the total represents a 12% drop from the brisk pace of October.

An improvement in mass housing, however, succeeded in holding the total private market to within 1% of November, 1960. But in the 11-month period private contract awards of $10.2 billion remain 10% below the same 1960 period. Whittling of the year-to-date gains in both commercial and industrial building offset improvements scored by housing.

Public construction contracts also reflected a seasonal slowdown last month. State and municipal work totaling $838 million dropped 12% below October and topped November, 1960 by less than 1%. Eleven-month volume holds its 7% gain over 1960 with an award total of $8.2 billion.

Federal work totaling $142 million fell far below November of last year, resulting in an unexpected decline of 2% at the end of 11 months. This compares to a 5% gain at the end of the 10-month period ending in October.

Since the Administration made much of its reversal of policy on new reclamation starts, an upturn in federal contracting was expected. The setback appears concentrated in New England, Middle Atlantic and the Far West.

Private mass housing awards of $4.8 billion in the first 11 months lag behind last year by 10%. This sector of the market scores with a strong recovery, for at the end of August housing awards were 18% behind the comparable period in 1960. November's volume of more than $500 million for housing topped every November on record.

November's upturn in commercial contracts lacked the force to bring volume ahead of November, 1960, thus the gain in the 11-month period falls to only 1% compared to a gain of 5% at the end of 10 months. Two major office buildings went into the month's new business, a $35-million structure in Chicago and a $20-million building in Boston.

Only waterworks and unclassified projects went against November's downtrend in public construction.

At the end of November, only the South still showed a gain over 1960, widening the margin for 11 months to 8%. The Middle Atlantic region slipped 1% below a year ago, although its $5.1 billion tops all others.

New England remains 21% behind last year, Mississippi to the Rockies and the Far West, both 5% behind, and the Middle West, 4%.

Costs Decline for December

Construction costs this month fall from the record monthly high set in November.

ENR's 20-Cities Construction Cost Index stands at 854.97 this month, a decline of 0.1% from November, but an increase of 3% since December 1960.

The Building Cost Index falls to a lower level this month, dropping 0.1% from November. The reading of 570.39, however, is 2% above December of last year. Both the Building Cost and Construction Cost Indexes are based on 1913 as 100.

The values of each index bring costs close to, but short of ENR's forecast of 1961, which put the Construction Cost Index at 862.55 by this month, and the Building Cost Index at 578.64.

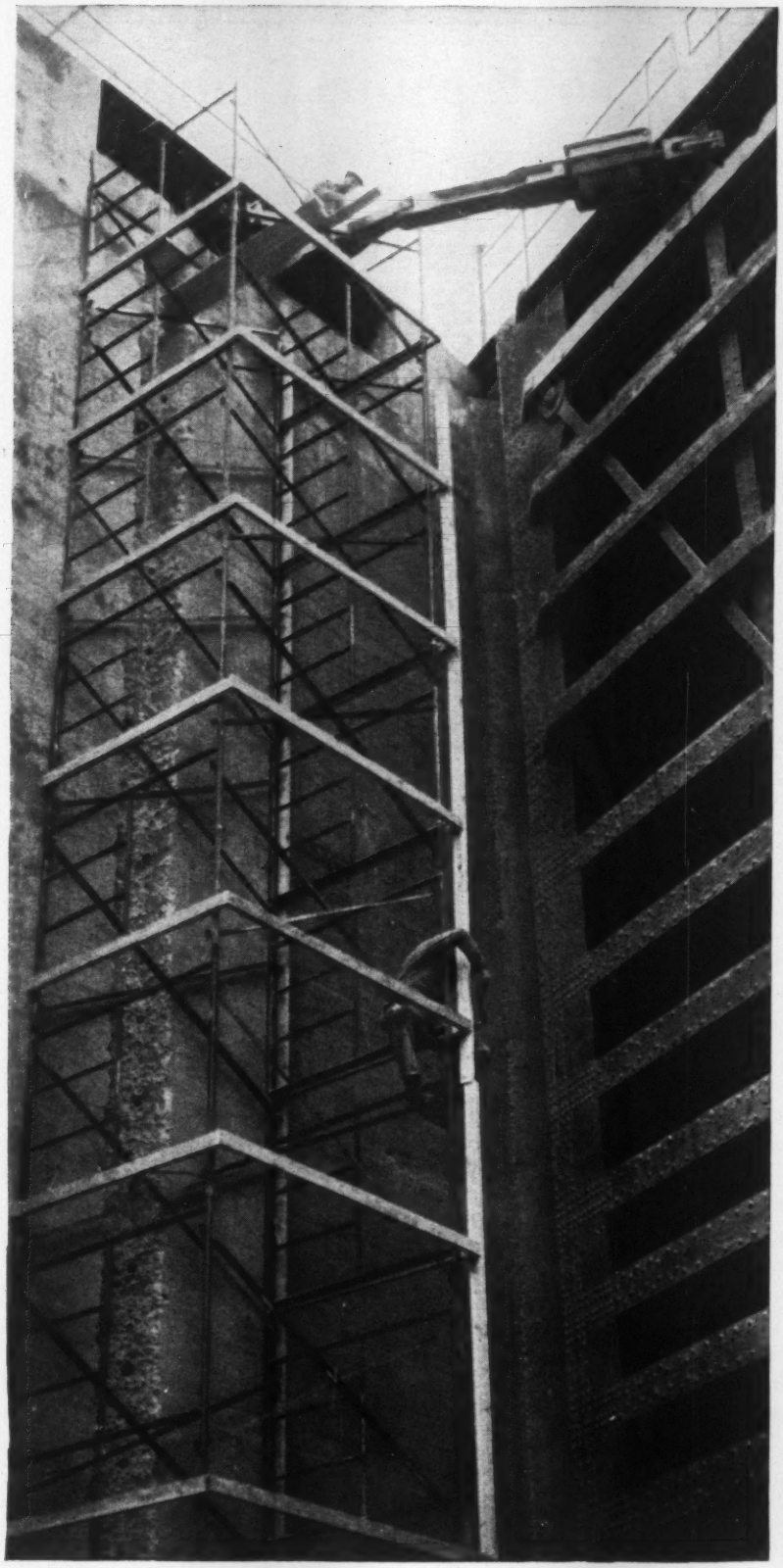
Weakening prices for Douglas fir 2x4s helped push this month's indexes lower this month. New York City and San Francisco recorded drops of $1 and $2 per Mbf respectively.

Engineering Construction Contracts for November

	November, 1961								Eleven Months			
	New England	Middle Atlantic	South	Mid-West	Mississippi to Rockies	Far West	Total U. S.	% Change '60 to '61 (Av. wk.)	U. S. Cumulative 1961 (48 wks.)	1960 (47 wks.)	% Change '60 to '61 (Av. wk.)	Canada Nov. 1961
Public Works, Total	34,353	253,815	185,304	124,118	190,157	192,106	979,853	−12	10,403,260	9,710,643	+ 5	74,265
Waterworks	3,037	13,278	5,536	10,616	7,777	11,389	51,633	+ 7	384,978	424,114	−11	5,336
Sewerage	7,302	6,207	9,587	19,953	13,330	18,315	74,694	− 0.3	757,015	544,912	+36	7,981
Bridges	104	25,978	20,604	8,370	10,209	7,565	72,920	− 0.1	623,976	731,749	−17	6,352
Earthwork, waterways	1,997	8,369	8,734	683	45,906	11,042	76,731	+14	761,062	703,297	+ 6	6,287
Streets and roads	8,467	100,413	53,092	39,439	61,697	67,290	330,398	− 1	3,499,304	3,102,987	+10	18,286
Buildings: Residential	2,148	30,202	8,306	8,481	3,296	7,071	59,504	−40	754,683	639,579	+16	3,339
Other	8,929	49,111	48,070	33,488	24,267	51,229	215,094	−32	2,454,639	2,269,586	+ 6	25,264
Unclassified	2,369	20,257	31,375	3,088	23,585	18,205	98,879	− 5	1,167,603	1,294,419	−12	1,420
State & Municipal	30,641	245,636	153,890	122,595	124,379	160,860	838,001	+ 0.5	8,230,979	7,548,732	+ 7	66,460
Federal	3,712	8,179	31,414	1,523	65,778	31,246	141,852	−50	2,172,281	2,161,911	− 2	7,805
Private, Total	61,855	344,654	178,324	182,783	188,313	134,885	1,090,814	− 1	10,226,419	11,068,002	−10	121,755
Bridges					100	300	400	−90	1,053	8,695	−88	
Buildings: Industrial	6,227	81,006	90,318	29,685	57,241	18,998	283,475	−11	2,644,524	2,574,621	+ 1	51,660
Mass housing	23,077	217,653	47,721	76,639	73,604	85,375	524,069	+29	4,757,801	5,182,124	−10	45,412
Commercial	32,019	44,870	31,300	74,791	39,072	28,558	250,610	−28	2,408,431	2,333,069	+ 1	24,683
Unclassified	532	1,125	8,985	1,668	18,296	1,654	32,260	+58	414,610	969,493	−58	
Total, Nov., 1961—5 wks.	95,208	598,469	363,628	306,901	378,470	326,991	2,070,667	− 7				196,020
Total, Oct., 1961—4 wks.	138,410	573,416	292,316	264,826	344,432	255,646	1,869,046					180,641
Total, Nov., 1960—4 wks.	97,833	549,447	241,432	228,345	328,827	329,025	1,774,909					94,619
Eleven Mos., 1961 (48 wks.)	1,640,428	5,072,671	3,516,673	3,076,602	4,459,810	3,463,495			20,629,679		− 3	1,695,969
Eleven Mos., 1960 (47 wks.)	1,287,713	5,001,034	3,200,588	3,149,256	4,584,672	3,555,382				20,778,645		1,778,633
% Change '60 to '61 (Av. wk.)	−21	−1	+8	−4	−5	−5						−7

ENGINEERING NEWS-RECORD *reports U. S. (50 states) construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.*

HOW TO MAKE LITTLE OF BIG REPAIRS



Polysulfide-epoxy adhesive speeds, simplifies concrete reconstruction on big river lock

After years of wear and weather, Lock #1 desperately needed reinforcing. Repair time was important. Shipping could not be interrupted for an extended period. Soil conditions were poor. Driving sheet piling proved impractical.

Through use of concrete adhesive combining THIOKOL polysulfide polymer and epoxy resin, engineers met the problems squarely.

By applying the compound to existing base structures (areas where concrete had worn and eroded), they were able to add new sections of reinforced concrete. Adhesive bond between old and fresh concrete provided by the polysulfide-base material proved *stronger than concrete itself,* in effect created one continuous structural unit.

Repairing sidewalls: polysulfide-epoxy adhesive used to grout steel dowels into existing walls, cured inside 24 hours. Well-anchored dowels tie old and newly-poured-in-place vertical columns of concrete. A strong, unified structure delivered well within limited time schedule.

Waterproof, practically indestructible, the bond produced by THIOKOL polysulfide polymer/epoxy adhesive has restored better-than-new serviceability to highways, bridges, buildings, dams, locks, reservoirs. Big job and small, all were done with great economies in time and dollars. *For full information, write for brochure CA-200.*

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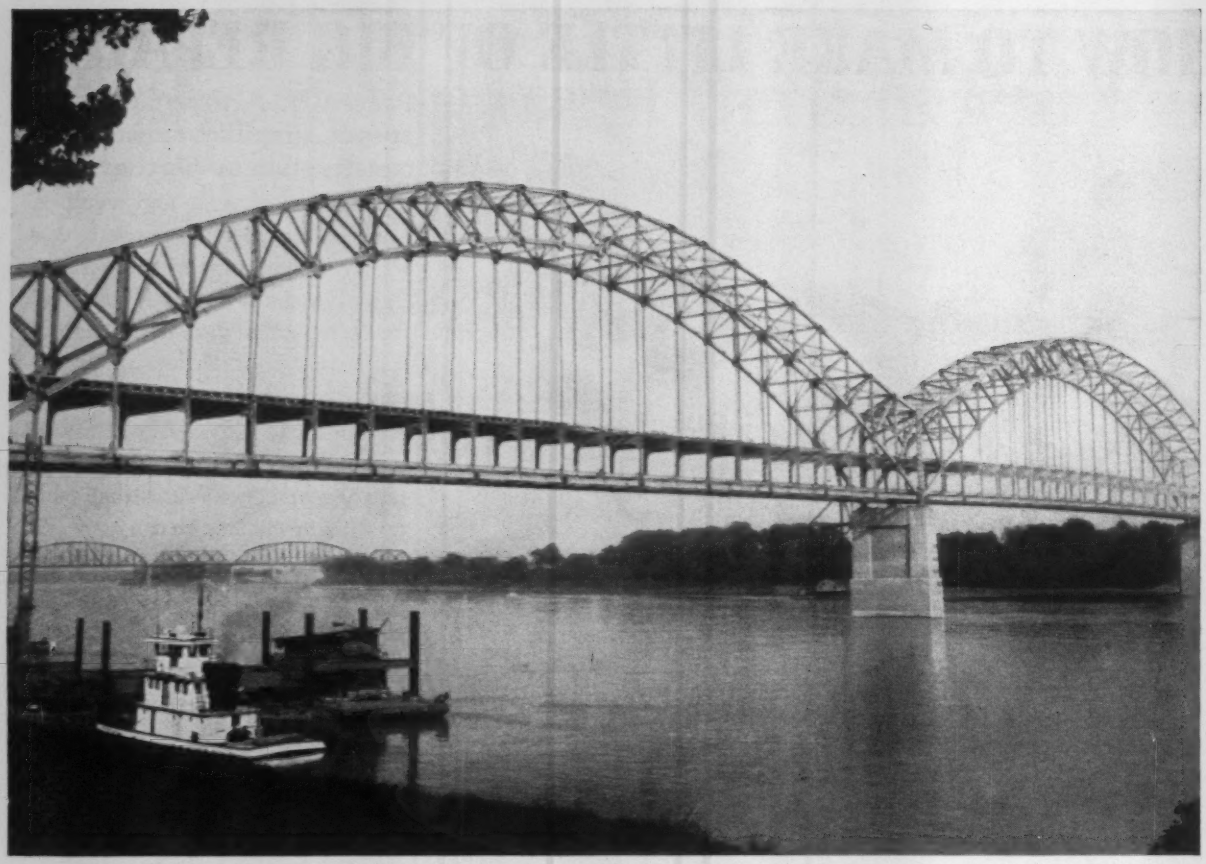

New Ohio River bridge between Indiana and Kentucky. Designed by Hazelet & Erdal, Consulting Engineers, for the State of Indiana and the Commonwealth of Kentucky. Superstructure fabricated and erected by Structural Steel Division of R. C. Mahon Company, Detroit. John F. Beasley Construction Company, Dallas, Sub-Contractor for Erection. Suspender assemblies by Roebling. Photo: Courtesy R. C. Mahon Company.

start of a good "suspense story"...

double decker gets strong support from Roebling cable

The new bridge over the Ohio River between New Albany, Indiana and Louisville, Kentucky, a tandem, tied-arch, double-deck structure, incorporates a number of unique features in both design and construction. The superstructure consists of two 800-ft-long double-deck spans, each deck carrying a 42-ft-wide triple-lane roadway with safety walks at each side.

Decks are supported with 68 double-suspender assemblies made by Roebling. At the upper end, two strands share a common socket; at the lower end, each occupies an individual socket. The suspender assemblies were accurately measured and fabricated at Roebling's plant so that equal loads would be carried by each leg, eliminating the necessity of field adjustment and shimming. Each double suspender was composed of two parts of 2½-in. prestretched galvanized bridge strand, providing an ultimate strength of more than 1,500,000 lbs for each assembly.

This represents only one of a multitude of ways in which Roebling know-how and products are economically utilized for bridges and for support, suspension and transportation systems of many kinds. If you have a problem of this nature—no matter how difficult or unusual—you'll find it pays to contact Roebling first. Roebling has the experience, the products and the specialized services to fill the most complex needs.

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Building Trades Seek Realistic Unity

- **They propose use of AFL-CIO Executive Council as forum for settling disputes with industrial unions.**
- **Reaffiliation of teamsters wins qualified support that makes James Hoffa and jurisdiction the jokers.**

The building trades unions last week gave the AFL-CIO another chance to settle the jurisdictional quarrel between craft and industrial unions without destroying the merged labor movement.

In a strong bid for labor unity on a realistic basis, they rejected an industrial union demand for final and binding arbitration of internal disputes and came up with a counterproposal of their own.

The building trades' settlement plan, to be presented to the AFL-CIO convention opening this week in Miami Beach, Fla., provides for the settlement of specific disputes by the Federation's Executive Council, if voluntary efforts to settle them at the local level have failed.

At the same time, the building trades took some of the dynamite out of the issue of teamster union reaffiliation.

They voted to urge the AFL-CIO to process a teamster application for readmission to the AFL-CIO, if one is made, but to allow reaffiliation only if the teamsters union agrees to respect the existing rights of AFL-CIO affiliates and is found to be in full compliance with all AFL-CIO standards and policies. Because of the strings attached, the resolution has little meaning at the present time except to make it clear that the building trades fully support the AFL-CIO's anti-corruption stand and will not make the teamster problem a secession issue.

Both actions occurred at the 51st convention of the AFL-CIO Building and Construction Trades Department held last week at the Balmoral Hotel in Miami Beach.

Although the action of the construction unions commits the building trades to work toward peaceful solution of internal differences, it provides no assurance that any workable solution can or will be found.

Building Trades Department President C. J. Haggerty concedes that the relationship between his Department and Walter Reuther's Industrial Union Department has deteriorated almost to the breaking point. He admits that the record has become "confused and distorted." He feels that the situation is not hopeful, but says he does not want to leave the impression that it is entirely hopeless.

The building trades' strategy was to put the issue in a better perspective and "to set the record straight."

Mr. Haggerty explained that the problem is a bread and butter issue. His unions, he said, "take the position that our jurisdiction is our life-line. We cannot survive if it is cut by arbitration or otherwise." Others said the inter-union rivalry for jobs is being intensified by the recession, automation and changes in the workforce.

AFL-CIO President George Meany, however, said the jurisdictional quarrel has been grossly exaggerated. He called the McClellan committee, anti-labor forces and repressive legislation problems of far greater consequence.

"Strife within the trade union movement," he noted, "is nothing new. In fact, it is sort of built into the union movement." The task, he explained, is to find a way to live with it rather than to solve it completely.

But the convention oratory made it clear that the task has become almost impossible because of the ideological difference between IUD leaders and old-line building tradesmen, who speak a different language.

(Mr. Haggerty got a vote of confidence in the form of unanimous re-election to the presidency of the AFL-CIO Building and Construction Trades Department. J. H. Lyons, Jr., newly elected president of the iron workers union, was named tenth vice president. All other vice presidents were reelected.)

Mr. Reuther and his group, oriented toward idealism and perfectionism, want sure-fire arbitration machinery that will produce final settlements enforceable in the courts even if this means redeterminations of basic jurisdiction by outsiders (ENR Nov. 23, p. 80). The IUD proposal would require adherence to the principle of "non-aggression." It would protect existing jurisdictions, even those acquired by raiding, and it would ban, on the threat of expulsion, boycotts by one union of goods made by members of another union. This is the type of boycott that occurred in the sheet metal workers-steelworker dispute at Burt Manufacturing Co.

The IUD proposal is anathema to the realistic building tradesmen who abhor compulsion and who will go down fighting, if necessary, to protect their basic jurisdictions and the "free voluntary character" of the trade union movement.

Essentially, the building trades want some type of machinery similar in concept to their in-family, voluntary, imperfect but beneficial National Joint Board for the Settlement of Jurisdictional Disputes. That Board has enabled the construction unions to live in some semblance of peace with their own jurisdictional disputes for years.

In their proposal, the building trades call for voluntary efforts to settle disputes at the local level as the first step. Disputes not so settled would be referred to the AFL-CIO Executive Council for decision on a case-by-case basis. The decisions would not determine "work or trade jurisdiction." Unions that refuse to comply with Council decisions could be cited before the convention for "appropriate action."

The proposal avoids the pitfalls of the jurisdictional guidelines established by the Miami agreement, which was negotiated in an earlier and unsuccessful attempt to solve the conflict. And it steers clear of the controversies raised by the jurisdictional proposals of a special committee known as the Hayes Committee. Peter Schoemann, president of the plumbers union, claims that the last jurisdictional formula of the Hayes committee is rigged in favor of industrial unions, legalizes past raids by industrial unions, authorizes performance of new construction work by industrial unions, and bars the building trades from all maintenance work.

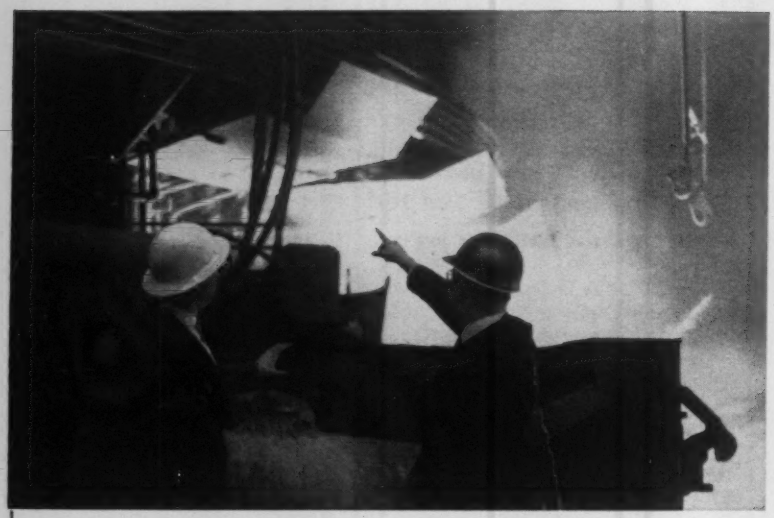
The AFL-CIO at its convention is more apt to choose the building trades' approach than the IUD one. Mr. Meany, whose influence over Federation direction cannot be overestimated, said last week that the only possible solution is one that will not be perfect. It must, he said, be based on voluntarism, must protect basic jurisdictions and must keep settlement of internal disputes inside the family.

In answering the acrimonious charges hurled at them by the IUD, the building trades took these positions on complex issues:

(Continued on p. 79)

"A Heated Discussion"

A short play on words and conduit



White hat: Whoo, boy, this is a real scorcher! Hardly breathe near this blast furnace. Show me those steel raceways.

Dark hat: Here they are. Been up there for years in all this heat. Hasn't fazed them a bit.

White hat: That'll look great in my report. Don't you think we're a little close to that hot stuff? I got this heavy wool suit on and . . .

Dark hat: You don't have to baby steel conduit, nossir. It's got the strength to take all the manhandling you can give it—and you can bend it without worrying about flattening or wrinkling.

White hat: Look at that hot stuff slosh around in there!

Dark hat: And you don't have to protect steel raceways with any organic covering when you run them through or along concrete. Saves a lot of time when you're putting in two, three miles of raceways.

White hat: Yeah. Well, that about wraps it up. Let's go!

Dark hat: You can thread steel conduit with regular dies and you don't need special lubricants to do it. Makes them easy to install and saves plenty of time and money.

White hat: You bet. Let's get out of here!

Dark hat: Steel conduit gives you a grounded metallic system, too; induced currents are drained off without danger.

White hat: Let's go!

Dark hat: Steel conduit's got a smooth interior; makes it easy to pull wires and cable and saves you a lot of time and money if you ever have to rewire. Let's go, OK?

White hat: Say, notice an odd smell . . . like wool burning?

USS TRADEMARK

National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors

United States Steel Export Company, New York

America's leading steel pipe manufacturer supplying America's foremost conduit manufacturers

This mark tells you a product is made of modern, dependable Steel.

(Continued from p. 77)

• Industrial union use of no-contracting-out clauses in their labor contracts violates the Miami agreement and the merger agreement.

• Building trades' use of the standard maintenance agreement is a legal exercise of historical jurisdiction. (It is privately felt in some construction union quarters, however, that building trades' promotion of contract maintenance through the Construction Industry Joint Conference does violate the Miami agreement, which says running maintenance belongs to the industrial unions. The IUD wants the AFL-CIO to ban building trades' participation in the promotional efforts.)

• The building trades have never applied the Denver case prohibition against boycotts to the industrial unions and the IUD was completely unjustified in killing the situs picketing bill on that ground.

• The Labor Secretary's Holland Committee report on Davis-Beacon prevailing wage application to missile work is slanted in favor of industrial unions who seek illegally to use it for jurisdictional determinations. (Last week, Secretary Goldberg, aware of strong construction industry opposition to the report, said the report will not be acted on until all critics could be heard.)

The building trades have also injected the jurisdictional issue into the teamster problem. One of the conditions they impose for readmission is that the teamsters come back on "terms fully protective of the rights of all affiliates of the AFL-CIO under the AFL-CIO constitution." This means that the teamsters will not be welcome by the building trades as long as they assert the right to organize in any jurisdiction, a right written into the teamsters' constitution earlier this year.

Both problems, jurisdiction and teamsters, are expected to make for a noisy AFL-CIO convention. But present indications are that neither issue will do any lasting damage to labor unity and that no immediate solution will be found for either problem.

NCA Proposes Economic Council

Formation of a voluntary joint labor-management council on economic policy for the construction industry was suggested last week by H. E. Lore, president of the National Constructors Association.

Addressing the 51st convention of the AFL-CIO Building and Construction Trade Department in Miami Beach, Fla., Mr. Lore said that such a council could provide guidelines for local bargaining and could serve as a nucleus of a voluntary self-governing stabilization council for the industry during a period of national emergency.

Behind the council idea, Mr. Lore said, are two major problems faced by the construction industry:

• The loss of construction work by union contractors to nonunion construction firms and to industrial unions.

• The growing threat of further government controls and the assumption of construction industry decision-making by outsiders unfamiliar with the intricacies of the industry.

Mr. Lore warned that the first problem should be considered at the bargaining table "lest union and union contractors price themselves out of the market."

The second problem, he said, is already causing distress in the industry. As examples, Mr. Lore cited the activities of the Missile Sites Labor Commission, the Missile Site Public Contracts Advisory Committee (known as the Holland Committee) and the Small Business Administration (SBA).

Mr. Lore said that the Missile Sites Labor Commission has weakened the National Joint Board for the Settlement of Jurisdictional Disputes by attempting to resolve disputes of this kind at missile sites and has injected itself into the collective bargaining process. He accused the Holland Committee of recommending Davis-Bacon prevailing wage criteria that are unrealistic and detrimental to the construction industry. And he charged the SBA with disrupting the industry by subsidizing inexperienced contractors.

Edward T. Kelly, manager of the Associated General Contractors Labor Relations Department, denied in another convention address that the Missile Sites Labor Commission has any detrimental effect on the National Joint Board, but he agreed with Mr. Lore that promotion of open shop contractors by SBA has had an adverse effect, especially in missile base work.

Mr. Kelly, said, "We feel that the critical issue of trying to build missile sites is no place for a social experiment." He said further that putting nonunion men on a job with union workers is as impracticable as trying to mix oil with water.

The industry and the government faces that problem at Cape Canaveral. The problem has not yet been solved, but efforts are currently under way by labor and management to negotiate a stabilization agreement that may afford at least a partial solution.

OFFICIAL PROPOSALS

Bids: January 16, 1962

Philadelphia, Penna.
Procurement Department
Water Department

Sealed bids will be received in Room 313, City Hall Annex, until 2.30 P.M., Eastern Standard Time, on Tuesday, January 16, 1962, and opened at that time for:

BID NUMBER 2897—WORK NUMBER SD-273-SW—Construction of Intercepting Sewer in 26th Street from Right of Way (Formerly Shunk Street) to Penrose Avenue (Lower Schuylkill East Side Intercepting System).

PRINCIPAL ITEMS OF WORK

Excavation in Tunnel	4,920 cubic yards
Excavation—open cut—shafts, manholes	1,100 cubic yards
Excavation—open cut—sewer pipe	2,450 cubic yards
Vacuum Processing in Tunnel	16,335 square feet
4 feet Diameter Concrete Sewer in Tunnel	4,680 lin. feet
3 feet Diameter Concrete Sewer on concrete base	699 lin. feet
Manholes	12
Paving	125 square yards

Proposal forms, questionnaires and specications may be obtained from the Water Department, in Room 1132, City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. Blueprints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Company, 1230 Arch Street, Philadelphia 7, Penna.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, Room 1113, City Hall Annex, at least one (1) week prior to the date of opening bids.

Each proposal must be accompanied by security in form and amount as set forth in the proposal form.

District of Columbia—Bridge Construction—November 16, 1961. CONSTRUCTING APPROACH STRUCTURES NO. 1201, 1202 and 1203 FOR THE THEODORE ROOSEVELT BRIDGE, FEDERAL-AID INTERSTATE PROJECT NO. I-66-1(15)0, Invitation No. C-6267-H, consist. of approx. 2,543 cu. yds. Class BB AE concrete in rigid frame structure and wingwalls below masonry; 1,062 cu. yds. of Class A Dimension Granite Masonry, incl. backing concrete; and 2,393 cu. yds. of Class C Granite Masonry, incl. backing concrete. Bid forms, plans and specifications are now available from Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EST, December 20, 1961, in Room 424, 499 Penn. Ave., N.W.

District of Columbia—School Construction—November 17, 1961. CONSTRUCTION OF NEW ELEMENTARY SCHOOL, 11th and Clifton Sts., N.W., Washington, D. C. (Invitation No. C-6289-B). Bid forms, plans and specifications are now available from Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EST, December 14, 1961, in Room 424, 499 Penn. Ave., N.W.

District of Columbia—Sewage Treatment—November 21, 1961. SEWAGE TREATMENT PLANT ADDITIONS, SECONDARY TREATMENT PLANT, Unit 23A—2nd Half, Part 2, (Invitation No. C-6261-S), consist. of Aeration Tank #4 and Final Sedimentation Tanks #10 and #12. Bid forms, plans and specifications are now available from Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EST, December 15, 1961, in Room 424, 499 Penn. Ave., N.W.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: December 21, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y., Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 21st day of December 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. FULLER, District Engineer, 353 Broadway, Albany, New York						
Albany (Int. Trg. Rte. 787)	FIC 61-22 FAC 61-23	Interstate Rte. Conn. 540 (Albany: Route 9W to Green St.–Cont. 2) City of Albany: Southside Route Arterial Highway Proj. EI-787-3(49), U-1132(3)	1.34 (3.05 Acc.)	9" Cem. Conc. Pavt., 2 @ 37' Var.= 3.51 Mi. Asph. Conc.= 0.48; Misc. Work = 0.40 3 HGS Comp. I Beam, 1 HGS Comp. I Beam & Plate Gird.	$250,000 Plans $10	$4,727,000
Schenectady (Int. Trg. Rte. 890)	FIC 61-24	Interstate Rte. Conn. 550 Edison Ave. to Broadway Proj. I-IG-890-5(20)	0.30	Demolition of Buildings	$2,200 Plans $5	39,000
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, New York						
Hamilton Warren (Rte. 28)	FARC 61-167	Indian Lake-County Line, S.H. 1100 Indian Lake-North River, S.H. 8152 North Creek-North River, S.H. 1515 Proj. F-478(2)	12.24 (2.00 Acc.)	Asph. Conc. Type 1A = 12.24 Mi. Bit. Double Surf. Treat.= 2.00 Mi. Reinf. Conc. Closed Box Bridge Rehabilitate Truss & I Beam Bridge	$285,000 Plans $5	5,222,000
Oneida	M 61-9	Nine Mile Spillway on Erie Canal One Mile North of the Village of Oriskany	....	Rehabilitation of Spillway Misc. Gate & Channel Work	$18,000 Plans $5	335,000
Oneida	U. S. 108	New Gates—Lowering Sills and Lower App. Slab & Misc. Work	....	Lock 20E, Erie Canal, Cary's Corners	5% of Bid Plans $10	Confidential
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington St., Syracuse, New York						
Oswego (Rte. 176)	FARC 61-166	Granby Roads (Bowens Cors. Section) S.H. 653 Proj. S-621(1)	0.04	Asphalt Conc. Corrugated Plate Culvert	$800 Plans $5	15,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	M 61-16	Rochester: Court Street Dam on Genesee River	....	Cleaning and Painting Sector Gates 3 & 4	$1,400 Plans $5	24,000
DISTRICT No. 5, N. W. KRAFF, District Engineer, 65 Court Street, Buffalo 2, New York						
Erie	FATS 61-18	Buffalo: Kensington Expressway Arterial Highway, Section 1 (East Tupper Street to East Utica Street) Cont. 4 Proj. U-377(23)	1.91	Traffic Signs	$2,000 Plans $5	36,000
Erie	FAC 61-5	Buffalo: Kensington Expressway Arterial Highway Section III (Northland Ave. to Fillmore Ave.) Proj. U-377(21)	0.66	Demolition of Buildings	$6,000 Plans $5	105,000
Niagara (Int. Trg. Rte. 190 Rte. 18D)	NIE 61-5 FINIE 61-4 FARC 61-129	Interstate Route 506, Niagara Expressway-Contract 5 (North Grand Island Bridge to Gill Creek) Porter Ave. Pt. 1, S.H. 1756, Porter Ave. Pt. 2, S.H. 1858 Proj. EI-EIG 190-1(43); S-606(2)	4.99 (5.74 Acc.)	9" Cement Conc. Pavt., 2 @ 24' Var.= 5.93 Mi. Asph. Conc.= 4.68 Mi.; Misc. Work = 0.12 Mi. 5 H.G.S. Comp. I Beam; 2 H.G.S. Comp Plate Girder; 1 R.R.G.S. Comp. I Beam; 1 R.R.G.S. Comp. Plate Girder	$615,000 Plans $10	11,176,000
DISTRICT No. 6, W. J. DENNIS, District Engineer, State Office Building, 30 West Main Street, Hornell, New York						
Allegany (Rte. 408 & 305)	FATC 61-4	Cuba-Friendship, S.H. 5174, Obi-Cuba, S.H. 965 Proj. F-294(3)	....	Traffic Signals	$1,500 Plans $5	26,000
Steuben	FASS 61-15	Hammondsport-South Pulteney, C.R. 76 Proj. S-594(1)	0.55	Asphalt Concrete	$10,000 Plans $5	192,000
DISTRICT No. 7, J. C. NORTON, Acting District Engineer, 444 Main Street, Watertown, New York						
Lewis (Rte. 12)	P.A. 61-2	Boonville-Port Leyden, Part 2, S.H. 8472	0.23	Grading, Drainage and Misc. Work	$500 Plans $5	9,000
DISTRICT No. 8, M. N. SINACORI, District Engineer, 28 Dutchess Turnpike, P. O. Box 551, Poughkeepsie, New York						
Columbia Rensselaer (Rte. 20)	R.C. 61-158	New Lebanon-Brainard, S.H. 615 Brainard Station, S.H. 5108	6.93	Subsealing Cement Conc. Pavt.	$4,500 Plans $5	82,000
Rockland	FASS 61-16	Little Tor Road (Collyer Ave. to New Hempstead Rd. and Phillips Hill Rd. to South Mountain Rd.) Proj. S-311(2)	2.05	Asphalt Conc. Twin Box Culvert	$32,000 Plans $5	577,000
Westchester (Int. Trg. Rte. 287)	FICWETS 61-2	Interstate Route Conn: 520 Cross Westchester Expressway Proj. I-287-2(29)	10.79	Additional Traffic Signs	$3,000 Plans $5	54,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 26)	FARC 61-165	Vestal-Vestal Center-Choconut, S.H. 8331 Proj. F-U-482(5)	1.93	Asphalt Concrete	$88,000 Plans $5	1,602,000
Delaware Broome (Rte. 17)	FARC 61-168	Hales Eddy-Hancock, S.H. 5167 Deposit-Hales Eddy, S.H. 5045 Windsor-Deposit, S.H. 5338 Deposit, S.H. 265 Proj. F-FG-336(18), F-FG 344(30)	6.70 (5.75 Acc.)	9" Cement Pavt., 2 @ 24 Var.= 8.65 Mi.; Asphalt Conc.= 1.25 Mi.; Bituminous Stab. Course = 2.51 Mi. Misc. Work = 0.04 Mi.; 4 H.G.S. Comp. I-Beam; 2 H.G.S. Comp. Welded Plate Gird; 2 Bridges Comp. Welded Plate Gird; 4 RRGS Comp. I Beam; 1 RRGS Prestressed Concrete	$600,000 Plans $10	11,367,000
Delaware Ulster (Rte. 28)	FARC 61-163	Fleischmanns-Margaretville, S.H. 239; Griffin Corners, S.H. 36; Pine Hill-Griffin Corners, S.H. 5177 Proj. F-659(9)	4.27	Asphalt Conc.= 4.22 Mi.; Misc. Work = 0.05 Mi. Composite Plate Girder Bridge; Reinf. Conc. Closed Box Bridge	$123,000 Plans $5	2,251,000
DISTRICT No. 10, A. M. SARR, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	FAWOBE 61-3 FARC 61-162	Wantagh-Oyster Bay Expressway, North Hempstead Turnpike, S.H. 9018, New Bridge Road, S.H. 546 Proj. U-1110(5), U-541(12)	....	Demolition of Buildings	$1,100 Plans $5	20,000
Nassau	FAWOBETS 61-4	Wantagh-Oyster Bay Expressway, Contract 2A (Hempstead-Farmingdale Turnpike, S.H. 9064 to Old Country Road, C.R. 4) Proj. U-1110(6)	4.47	Traffic Signs and Delineators	$5,500 Plans $5	97,000
Queens	FAVWE 61-5	Van Wyck Expressway Extension, Contract 4 (Northern Boulevard-Long Island Expressway) Proj. U-UG-1085(23)	1.14 (0.66 Acc.)	Cem. Conc. Wearing Surface (St. Slab) 1.51 Mi. Cement Conc. Pavt.= 0.03 Mi.; Asph. Conc.= 0.17 Mi.; Misc. Work = 0.09 Mi.; Viaduct—75 Comp. I Beam; 20 Precast Prestressed Conc.; 2 Comp. Built Up Steel Girders	$650,000 Plans $10	11,802,000
Suffolk	PSC 6638 PSC 7296	Elimination of Grade Crossings of the Long Island Railroad with Various Streets in Babylon Mantauk Division Central Branch Team Yard	3.56 (0.51 Acc.)	Track Relocation, R.R. Station, Signal Tower and Misc. Work = 2.58 Mi.; Cement Conc. Pavt.= 0.43 Mi.; Asph. Conc.= 1.06 Mi.; 7 RRGS Plate Gird; 2 RRGS I Beam; 1 Slab Viaduct; 2 Temp. Trestles Wood Bents	$400,000 Plans $10	7,532,000

(Continued on opposite page)

OFFICIAL PROPOSALS

(Continued from opposite page)

Suffolk	HSP 61-2	Hecksher State Parkway, Contract 3 (Southern State Parkway to Montauk Highway)	6.68 (2.49 Acc.)	8" Cement Conc. Pavt., 2 @ 37= = 5.44 Mi.; 24' Widening = 1.19 Mi.; Access = 2.49 Mi.; Misc. Work = 0.05 Mi.	$170,000 Plans $5	3,050,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: March 1, 1962

Republica De Nicaragua
Empresa Nacional de Luz y Fuerza
Managua

TMV HYDROELECTRIC SYSTEM, FIRST STAGE — CENTROAMERICA PROJECT, RIO CACAO POWER PLANT — CIVIL WORKS

Invitation for Bids

The Empresa Nacional de Luz y Fuerza (ENALUF), an autonomous entity of the State, Republic of Nicaragua, notifies that, having obtained financing from the International Bank for Reconstruction and Development and from the Development Loan Fund for the construction of the first stage of the TMV Hydroelectric System, will receive sealed bids addressed to the Gerencia de Construccion of the same entity for the construction works hereon specified, until 2.00 p. m. of March 1, 1962, at which time bids will be publicly opened and read aloud.

Contract No.
TMV I a 9

Work
Civil works for the Rio Cacao Power Plant.

Location: 5 kilometres NW of Jinotega, Jinotega Department, Nicaragua.

The principal items of the work are:

a. Power canal: 3, 8 km long, 550 000 m³ of earth excavation;

b. Intake: 14 500 m³ excavation, 2 000 m³ concrete, 40 tons reinforcing steel;

c. Power tunnel and Surge tank: 3 km, 3.00 I.D. tunnel; 40 000 m³ rock excavation, 11 000 concrete, 400 tons reinforcing steel;

d. Valve House and Penstock (civil works); 15 000 m³ excavation, 5 000 m³ concrete, 150 tons reinforcing steel;

e. Powerhouse and Substation (civil works); pit-type powerhouse for two, 25,000 kW units; 2 000 m³ excavation, 7 000 m³ concrete, 500 tons reinforcing steel;

f. Tailrace Tunnel and Stilling Basin; 350 m, 4.90 m I.D. tunnel; 213 000 m³ excavation, 3 500 m³ concrete, 100 tons reinforcing steel;

g. Miscellaneous Works: including a 110 m² storehouse, 500 m of access road, powerhouse water and sewer system and minor items.

Copies of Contract Documents, including Specifications and Drawings, may be obtained after December 1st, 1961 from:

1. Empresa Nacional de Luz y Fuerza, Gerencia de Construccion, Managua, Nicaragua, upon payment of 700 Cordobas for the first set, and 210 Cordobas for each additional set;

2. Electroconsult Consulting Engineers, Via Cavallotti 13, Milan, Italy, upon payment of 100 US Dollars for the first set, and 30 US Dollars for each additional set;

The above mentioned payments are not refundable.

Contract Documents including specifications and Drawings may be examined at the two abovementioned places, and at:

3. Nicaragua Embassy in Washington D. C., USA, 1677 New Hampshire Ave., N. W.;

4. General Consulate of Nicaragua in New York, N. Y., USA, 1720 Ave. of the Americas, Rockefeller Center, Suite 2200.

Each bid shall be accompanied by a bid bond for $40 000 Cordobas.

Date of invitation; December 1st, 1961.

Bids: December 21, 1961

The Port of New York Authority
Brooklyn-Port Authority Piers

PILE LOAD TESTS AT EXISTING PIER 17

CONTRACT BP-507.321

Sealed proposals for performing pile load tests on existing piles in existing Pier 17 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of the Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Thursday, December 21, 1961, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, December 7, 1961

Bids: February 16, 1962

Government of Hong Kong
Plover Cove and Hebe Haven Water Scheme

It is hereby notified that sealed tenders in duplicate are invited for the construction of the Lower Shing Mun Dam & Adjoining Tunnels (P.W.D. Contract No. 103 of 1961). The dam is to be 180 ft. high and will contain about 1¼ million cu. yd. of earth and rockfill. There will be about 1¼ miles of 22 ft. and 1 mile of 10¼ ft. equivalent diameter tunnel, shafts & stream intakes, a small concrete supply basin dam, bellmouth spillway and other ancillary works.

Tenders must be delivered to the Secretary of the Tender Board, Colonial Secretariat, Central Government Offices, Lower Albert Road, Hong Kong not later than 12 noon on Friday, 16th February, 1962. The package, if sent by post, must be registered and if delivered by hand must be placed in the Tender Box situated in the lift lobby on the 6th floor of the Central Government Offices (Main Wing) at the above address.

Tender documents and further particulars may be obtained from the offices of the Consulting Engineers for the Plover Cove and Hebe Haven Scheme in Hong Kong or London on deposit of a cheque for H.K.$400 or £25 refundable only on receipt of a bona fide tender.

Tenders will be only be accepted from firms who can show that they have previously executed successfully works of a similar nature and magnitude.

Contractors registered in Hong Kong and on the Public Works Department list of approved contractors need not pay the above deposit but will be liable to have their names removed from the list of approved contractors if they fail or refuse to implement an accepted tender or having obtained forms of tender fail to submit a bona fide tender.

The Government does not bind itself to accept the lowest or any tender.

Consulting Engineers:—
Binnie, Deacon & Gourley,
Artillery House,
Artillery Row,
Westminster,
London, S.W.1.

Scott & Wilson,
Kirkpatrick & Partners,
Manson House,
Nathan Road,
Hong Kong.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5715) will be received at Weslaco, Texas, until 10 a.m., Central Standard Time, January 9, 1962, for furnishing labor and materials for Rehabilitation of L and I-14 Lateral Systems, Mercedes Division, Texas, Lower Rio Grande Rehabilitation Project. Location, Mercedes, Texas. Principal items are 148,400 cu. yds. constructing embankments; 49,900 cu. yds. compacting embankments; 4,080 cu. yds. concrete in lateral lining; and other work. Completion time 810 days. For particulars, address Bureau of Reclamation, P. O. Box 1609, Amarillo, Texas; P. O. Box 357, Weslaco, Texas; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5710) will be received at Denver, Colorado, until 10 a.m., Mountain Standard Time, December 28, 1961, for furnishing labor and materials for constructing foundations and furnishing and erecting Steel Towers for Shiprock-Cortez Section of Shiprock-Curecanti 230-kilovolt Transmission Line, Transmission Division, New Mexico-Colorado, Colorado River Storage Project. Location San Juan County, New Mexico and in Montezuma County, Colorado. Principal items are 1,230 cu. yds. concrete; 2,900,000 pounds, furnishing tower bodies; 184 towers, erecting towers; and other work. Completion time 550 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City, Utah; P. O. Box 1477, Page, Arizona; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

CONTRACTORS—
WATCH
THIS SECTION
for New Projects

OFFICIAL PROPOSALS

Bids: January 31, 1962

San Jose-Santa Clara Sewage Treatment Works Improvements

NOTICE TO BIDDERS

Separate sealed proposals for the construction and installation of additions and improvements to the existing sewage treatment works of the cities of San Jose and Santa Clara, California, to wit: For Divisions A, B, C, and D, respectively, of the San Jose-Santa Clara Sewage Treatment Works Improvements, 1961, are invited and will be received by the City Clerk of the City of San Jose at his office in Room 408 of the City Hall of the City of San Jose, First and Mission Streets, San Jose, California, on or before 11:00 o'clock a.m., Pacific Standard Time, January 31, 1962.

In general, improvements consist of the enlargement and expansion of the existing primary sewage treatment facilities of the cities of San Jose and Santa Clara from a nominal capacity of 51 MGD to a capacity of 94 MGD. They further include the construction of new secondary treatment facilities of a modified activated sludge type with a nominal capacity of 94 MGD, complete with new outfall sewer and channel.

The work is divided into four Divisions. The work and improvements included in each Division is briefly described as follows:

DIVISION A

Aeration, Nitrification and Final Tank Batteries

DIVISION B

1. Blower Building and Service Wing
2. New Administration Building
3. Pump and Engine Building Addition
4. Grit Building Superstructure
5. Sludge Control Building Superstructure
6. Service Station
7. Control Building "B" (New Primary Tanks)
8. Storage Building

DIVISION C

Major Sewers and Channel Construction

DIVISION D

1. Screen and Grit Units
2. Preaeration and Primary Tanks
3. Sludge Concentration Units
4. Sludge Digesters
5. Tunnels and Outside Piping
6. Site Development
7. Sludge Lagoons
8. Miscellaneous

All work for each Division must be performed in accordance with the Contract Documents for each Division, respectively, which are on file in the office of the City Clerk of the City of San Jose, California, City Hall, San Jose, California.

Separate proposals are solicited for each of the four Divisions. A bidder may submit a proposal on any one of the four Divisions without submitting a proposal on any other Division, or he may submit separate proposals on as many Divisions as he may desire.

No proposal for any Division will be considered unless it is made on the proposal form which is included in the Contract Documents for such Division.

All Contract Documents for each Division are on file and are available for inspection at the office of the City Clerk of the City of San Jose, Room 408, City Hall, First and Mission Street, San Jose, California. A copy of said documents is also available for inspection at the office of Consoer, Townsend and Associates, Project Engineer, at 360 East Grand Avenue, Chicago 11, Illinois.

Copies of the Contract Documents for each Division may be obtained from the City Engineer of the City of San Jose, City Hall, First and Mission Streets, San Jose, California, upon payment to said City Engineer the following amount for each Division:

Division A	$70.00
Division B	$140.00
Division C	$30.00
Division D	$110.00

for each set of documents so obtained.

The full amount of the deposit for one set of documents and one-half of the deposit for any additional duplicate sets of documents will be refunded to each bidder who submits a formal bid to the City of San Jose and who also returns the documents in good condition to the City of San Jose within ten (10) days after his bid security has been returned to him.

Equipment manufacturers, subcontractors and others who do not submit formal bids to the City of San Jose will be refunded one-half the amount of the deposit for all sets of complete documents returned in good condition to the City of San Jose within ten (10) days after the opening of bids. No refund will be made for documents received after this ten-day period.

Each proposal for each Division shall be accompanied by a certified or cashier's check or a bidder's bond payable to the order of the City of San Jose in an amount not less than ten percent (10%) of the bid as a guarantee that the bidder will within fifteen (15) days after the date of the award of the contract execute an agreement and file bonds and insurance as required by the Contract Documents if his proposal is accepted.

The award of any contract or contracts will be made by the Council of the City of San Jose. Said Council reserves the right to award a separate contract for any or for each of the above-mentioned four Divisions, or it may award a contract or contracts for any combination or combinations of said Divisions to the lowest responsible bidder or bidders on such combination or combinations.

The Council of the City of San Jose reserves the right to reject all proposals for any or all Divisions.

Dated: December 4, 1961.

Francis L. Greiner
City Clerk
City of San Jose, California

Bids: January 9, 1962

Power Authority of the State of New York Niagara Power Project

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF SCHOELLKOPF INTERCHANGE AND DEMOLITION WORK FOR
INCIDENTAL NIAGARA POWER FACILITIES IN
NIAGARA FALLS,
NIAGARA COUNTY, NEW YORK
SPECIFICATION NO. PA-N-23057
NIAGARA CONTRACT NO. N 48

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for the Construction of the Schoellkopf Interchange and Demolition Work for Incidental Niagara Power Facilities in Niagara Falls, Niagara County, New York, until 10:30 A.M. Eastern Standard Time on the 9th day of January 1962, at the Authority's Office, 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are: Estimated:

280,000 cu. yds.	Excavation, unclassified, various types
550 cu. yds.	Crushed rock for filter blanket
1,300 cu. yds.	Impervious blanket
2,800 lin. ft.	Vitrified clay pipe underdrain, 4" dia.
2,820 lin. ft.	Reinforced concrete pipe, 12" dia. to 30" dia
7,200 cu. yds.	Foundation course crushed rock
5,390 cu. yds.	Concrete, various structures
11,500 lin. ft.	Concrete curbs, various kinds
250,000 pounds	Reinforcement bars
2,500 lin. ft.	Granite curb
1,400 tons	Stone filled sheet asphalt
20 acres	Topsoil and Seeding

The length of the ramps of the interchange to be constructed under this contract is approximately 1.1 miles.

In addition, two bridges, a residence, two adjacent buildings and approximately ten structures consisting of buildings, bridge and silos shall be demolished and/or salvaged at the Schoellkopf Power Plant headworks. There are not less than 1325 tons of structural steel in these structures.

It is anticipated that demolition and/or salvage of the lower works and additional buildings at the headworks of the Schoellkopf Power Plant will be included in this contract by an addendum to be issued during the bidding period. During the bidding period, the Power Authority will advise prospective bidders with regard to the names of those parties which have expressed interest in purchasing equipment and materials to be removed from the Schoellkopf Power Plant.

The work shall be completed on or before November 1, 1962.

Plans, Specifications and Proposal Forms for the work may be obtained on or about November 28, 1961, from the Power Authority of the State of New York, at the Coliseum Tower, 18th Floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: January 17, 1962

Corporacion De Obras Sanitarias De Asuncion Paraguay

November 20, 1961

NOTICE TO BIDDERS

Sealed Bids are invited for furnishing and installing the mechanical and electrical equipment for a new diesel engine-driven generator and miscellaneous equipment in the Water Works System for the City of Asuncion, Paraguay, South America. The work includes furnishing, delivering to Asuncion, and installing:

a. A 500 KW Diesel engine-driven generator.
b. Additional switchgear cubicles.
c. Power factor correction equipment.
d. Three, 300 HP or larger, stepless primary resistor motor starters.
e. Furnishing and delivering, without installation, 23 and 6 KV outdoor line equipment.

Bids should be addressed to the Corporacion de Obras Sanitarias de Asuncion, and mailed or delivered to the office at Avenida España 575, Asunción, Paraguay, S. A. so as to be received not later than January 17, 1962, at 9:00 A.M. Bids will be opened publicly at that Office at the time stated, and all Bidders are invited to be present. Award of a contract will be made to the qualified Bidder submitting the most advantageous Bid.

The Contract Documents give specifications for the materials to be furnished.

Plans, Specifications and Contract Documents may be obtained from Rader and Associates, 100 Biscayne Boulevard, South, Miami 32, Florida, U.S.A., upon payment of $35.00. Additional copies of plans, when required, may be had upon payment of one dollar a sheet.

Each Bid must be accompanied by a Bid Guaranty in the amount of five per cent (5%) of the contract price. The successful Bidder will be required to furnish a Performance and Payment Bond in an amount not less than ten per cent (10%) of the Total Contract Price. The Surety Company furnishing the bid guarantee and the Performance and Payment Bond must be authorized to do business in the U.S.A., and the Surety Company and the form of the Guarantee and Performance and Payment Bond must be satisfactory to the Corporacion de Obras de Asuncion, Paraguay.

An equipment performance guarantee bond will be required.

Corporacion de Obras Sanitarias de Asuncion reserves the right to reject any or all bids.

CORPORACION DE OBRAS
SANITARIAS DE ASUNCION

Bids: January 10, 1962

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, January 10, 1962.

For Narrows Bridge Contract No. NB-12, Brooklyn Approach, Brooklyn, New York City.

Each bid must be accompanied by a deposit in the amount of $250,000.00.

The contract includes grading, drainage, concrete piers, retaining walls and abutments, seawall, steel viaducts and bridges and paving.

Plans, specifications and contract documents may be purchased at the office of the Authority for $130.00, which will not be refunded.

Read the Official Proposal Columns of ENGINEERING NEWS-RECORD This Week and Every Week

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

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DISPLAYED RATE:

The advertising rate is $45.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

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UNDISPLAYED RATE:

$2.70 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

• POSITIONS VACANT

Draftsman—experienced reinforcing bar detailer and checker. Permanent position with established steel producer. Submit resume of experience, references, and salary expected. All replies confidential. P-7811, Engineering News-Record.

Wanted—Civil Engineer—Experienced in subdivision calculations, design of streets, water and sewer systems, storm drains, etc. Send resume and salary requirements to Ralph L. Kraemer, Western Engineers, Inc., Las Vegas, Nevada.

C.P.A.—Years of experience in construction and taxes. Must be top man for top, steady position. P-7712, Engineering News-Record.

Engineers and Designers—one or two years of experience in water supply, water distribution, sewerage or sewage treatment plant design. Salary commensurate with ability. Address reply with resume to: O'Brien & Gere, Consulting Engineers, 400 East Genesee Street, Syracuse 2, New York.

Soils Engineer—Masters degree and four years experience. Assist in running consulting engineering office, start after January 1st. $9000 per year. ETCO Engineers and Associates, 10601 Airline Highway, Baton Rouge, Louisiana.

Field Engineer — Permanent position with established Midwest consulting firm for man thoroughly qualified and experienced in all branches of building construction. Moving expenses paid. Electrical or process engineer preferred. Send complete resume to P-7633, Engineering News-Record.

Office Manager and Estimator-Medium size general construction firm Eastern N. Y. S. Send photo and complete resume direct to Machnick Construction Co., Inc. 7 Oxford Rd., Troy, N. Y.

Construction-Superintendent, excavation concrete and related works for large power plant; two years; Caribbean area. P-7921, Engineering News-Record.

Chief Estimator — Expanding contracting firm seeking experienced qualified man to head estimating staff. Engineering background essential. Must be well experienced in estimating commercial and industrial buildings (federal or private) $1 to $5 million Class and must presently be employed in estimating work. Firm located in Southwestern part of United States. State age, experience, education and salary expected. P-7922, Engineering News-Record.

City of San Jose has openings for: Engineer I. Excellent opportunity for young civil engineers in fast growing municipality. Accredited degree in civil engineering or passage of E.I.T. (Senior students may take examination) Age 21-40, U.S. Citizenship, $517-$646 per month. Out of state examination can be arranged. Apply: Civil Service Department, Room 211, City Hall, 801 North First Street, San Jose, California.

Hydraulic Engineer. To head hydraulic engineering section of Central Engineering Department of large paper company. Power system has six power dams plus storage reservoirs. Experience in preparation of Federal Power Commission applications desirable but not necessary. Apply to Manager of Engineering & Research, Great Northern Paper Company, Millinocket, Maine.

Assistant to Superintendent of Public Works, Poughkeepsie, New York. Minimum Requirements: 1. Civil Engineer, New York State License. 2. Five years field and office experience, in highway sewer, water distribution engineering. Submit application with complete resume of education and experience to: Kenneth E. Pearce, City Mgr. Poughkeepsie, New York.

Chief Design Engineer, degree in Mechanical, Structural or Civil Engineering plus minimum five years in charge of medium to large mining, contracting, process or chemical plant design office. Location South America with large U.S. mining company. Transportation, housing, liberal vacations and wide range fringe benefits. All replies acknowledged. Send complete resume to P-7905, Engineering News-Record.

• POSITIONS VACANT

General Superintendent. Management opportunity with New York construction company. Experience in estimating, proposal preparation and sub-contract negotiations on lump sum projects. Reply in full confidence to P-7875, Engineering News-Record.

Electric Systems Engineer—Midwestern consulting engineering firm has challenging opportunity in electric systems planning. Work includes network analyzer, sectionalizing and economic feasibility studies. Permanent employment offered to man with 3 to 5 years experience. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Asphalt Plant Superintendent—Central Eastern Seaboard. Experienced man capable of handling complete plant operation, including ordering materials, plant production and deliveries. State experience & salary desired. P-7844, Engineering News-Record.

Structural engineer (P.E.). Min. 5 yrs. experience designing building frames and foundations. Send resume, salary expected, references, availability to Snyder & Troxel, Consulting Engineers, 300 Denison Bldg., Syracuse, N. Y.

Sanitary or Hydraulic Engineer with about five years experience in preliminary engineering and design of sanitary or hydraulic projects. Registration desirable, but not essential. Ability in writing and analysis important. Submit complete resume of education, experience and qualifications, together with salary requirements to P-7938, Engineering News-Record.

Party Chief—Permanent position Southeast Consulting Firm. Highway location, primarily urban. Send complete resume including salary requirements to P-7934, Engineering News-Record.

The Lewistown, Pennsylvania, Municipal Authority has a vacancy in the office of superintendent of its water department. About 7,500 customers. Applications from qualified and experienced water system managers are being accepted. Salary range $7,000 to $8,500. Send detailed application setting forth experience and qualifications to Richard S. Ruble, Chairman, 19 Valley Street, Lewistown, Pennsylvania.

Water Works Engineer: Graduate Engineer preferably with New York P.E. license to take charge of Water and Sewer Division. Opportunity for advancement. Salary open. All fringe benefits including vacation and sick leave, hospitalization, state retirement, social security. Send brief resume of qualifications to F. J. Laverty, Supt. Public Works, City Hall, Ithaca, New York.

Permanent openings for Resident Engineers experienced in supervision of construction of high-voltage transmission lines. Degree and registration desirable. Excellent opportunity with consulting engineering firm. Please send resume of education and experience, and salary requirements to P-7944, Engineering News-Record.

Township Engineer for a Suburban Community in Northern New Jersey—Requirements —Civil Engineer, Licensed P.E. Municipal Engineering experience. Design and Construction—Highway and Sanitary. Organizational and administrative ability desirable. Letters of application indicating experience, qualifications, training, reference and salary requirements, should be addressed to Stephen Szabo, 64 Sunset Road, Caldwell, N. J. Position must be filled by Dec. 15, 1961.

(Continued on following page)

OVERSEAS POSITIONS

ON SUBSTATION AND TRANSMISSION LINES IN THAILAND

Applications being accepted for the position of:

TRANSMISSION LINE AND SUBSTATION CONSTRUCTION SUPERVISOR

Construction engineer or general foreman with a minimum of ten years' experience in supervising the construction of 230 KV and 69 KV lines and substations. Technical graduate desirable, but equivalent in experience may be acceptable. Must have directly supervised the construction of steel and wood transmission lines and substations of voltages mentioned, including the procurement of materials, location and placement of equipment, etc. Ability to direct native Thai supervisors, who speak and understand English, and train them for responsible direction of future work necessary. Must be able to plan work from drawings and supervise forces to avoid delays and expedite completion. Good working knowledge of all standard line and substation materials and equipment of 69 KV and 230 KV essential. Supervisor must prepare intelligent and complete written reports of daily and weekly progress for management and the record. Applicants must be willing to sign a 24 month contract, pass a physical examination and security investigation. Salary, plus completion bonus, housing and food furnished. Air Travel to and from Bangkok. Send complete experience record, include salary information to:

SVERDRUP & PARCEL
AND ASSOCIATES, Inc.
915 Olive Street, St. Louis 1, Mo.

An equal opportunity employer

SANITARY ENGINEERS

Transfers to our new Palo Alto and New York Offices create vacancies for qualified Sanitary Engineers.

Send Resume of Education, Experience and Record of Past Earnings.

METCALF & EDDY
Statler Building — Boston 16, Mass.
Mr. Charles H. Ingalls — Personnel Manager

OVERSEAS POSITIONS

ON SUBSTATION AND TRANSMISSION LINES IN THAILAND

Applications being accepted for the position of:

CHIEF SUPERVISOR

Graduate electrical engineer, or equivalent gained through experience, who has had a minimum of fifteen years' experience in the design and/or field construction of steel and wood substations of 220 KV and lower voltage transmission substations. Must be able to direct the placement of equipment, expedite delivery of materials and schedule progress of work. Familiarity with control and instrument circuits essential; must be competent to assume responsibility for energizing equipment and writing operating instructions. Supervisor must be able to instruct Thai supervisors, who speak and understand English, in all phases of the work and be an able and willing teacher in educating them for future similar responsibilities. Equipment will include structures, synchronous condenser, transformers, switchgear, controls, etc. Applications must have had a successful record of accomplishment in his field. Applicants must be willing to sign a 24 month contract, pass a physical examination and security investigation. Salary, plus completion bonus, housing and food furnished. Air travel to and from Bangkok. Send complete experience record, include salary information to:

SVERDRUP & PARCEL AND ASSOCIATES, Inc.
915 Olive Street St. Louis 1, Mo.
An equal opportunity employer

PROJECT SUPERINTENDENT

STEAM ELECTRIC STATION—OVERSEAS

To supervise construction and start-up of 50,000 kw station in Far East. Heavy power plant construction experience required at same level of responsibility. CE or ME university degree preferred. Local living allowance and family accommodation. Tour starts immediately. This is a responsible position with a reputable consulting engineering firm. Send complete resume and reference to:

P-7870, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ALASKA OPENING

Assistant State Materials Engineer

Division of Highways, STATE OF ALASKA. Highway Engineer III, $12,000-$14,000. Registered professional engineer—Nine years of experience, three years supervisory in Materials testing, preferably in a State Highway organization. Retirement, annual and sick leave benefits—Group Health Insurance—Civil Service. Write:

DIRECTOR OF HIGHWAYS
Box 1841 Juneau, Alaska

City Planners AND Highway Engineers

Field & Office Survey Personnel

Salary commensurate with ability.

Openings at Rochester, Pennsylvania and Jackson, Mississippi

Interested Personnel Mail Resume To

PERSONNEL DEPARTMENT
MICHAEL BAKER, JR., INC.
Consulting Engineers
Rochester, Pennsylvania
or
NORTHSIDE STATION
P.O. Box 9997 Jackson, Mississippi

PLANT ENGINEER

needed by up & coming, diversified Chicago manufacturer. Assignment involves plant design, construction, operation & maintenance. Also product development & improvement. At least a B.S.M.E. required, along with appropriate experience. Age 35 to 50. Salary up to $15,000. Write for special application form, to:

King Whitney, Jr.
Box ENR 348 125 W. 41 St., NY

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For Bridge and Highway Projects

Send resume, references and salary requirements. Draftsmen include samples of recent work.

BROOKHART & TYO
3501 N. Front St. Harrisburg, Pa.

CONCRETE ENGINEER

Leading building materials producer in Mid-West has immediate opening for licensed C. E. with minimum of 5 years concrete design experience. Precast concrete design and production experience desirable. Position as assistant to division manager offers management opportunity. Age to 35 preferred; moving expenses paid; salary open. Send resume of training, experience and salaries earned to:

P 7951 Engineering News Record
645 N. Michigan Ave., Chicago 11, Ill.

FOR STATE OF CONNECTICUT

Highway Senior Engineer (Highway Design). Need civil or landscape engineering degree and 4 years' employment in civil, electrical or landscape engineering including 2 years' supervisory experience in field of highway design. Salary range: $6420-$8720. Complete and outstanding benefits.

Highway Assistant Engineer (Bridge Design). Need engineering degree and 3 years' employment in highway engineering, including 1 year in supervisory capacity. Salary range: $6000—$7640.

U.S. citizenship required. Take written merit examination in your state of residence. Write to Robert G. Mack, State Personnel Department, 105 State Office Building, Hartford, Connecticut.

★ *Expanded West Virginia Road Program Offers Opportunities for EXPERIENCED ENGINEERS*

Highway Design and Construction—Soils—Materials Testing—Urban Planning—Bridge Design

★ *YOUR RESUME HELD IN STRICT CONFIDENCE* ★

Starting Salaries From: $6,000 to $10,000

Retirement, vacation and sick leave benefits. Reply with resume for possible interview to: N. W. Goodman, P.E., West Virginia State Road Commission, Charleston, West. Va.

WEST VIRGINIA
State Road Commission
Charleston, West Virginia

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ASSIST. PROJECT SUPERINTENDENTS
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LOCATION FAR EAST
Qualified applicants submit resume to
THE KULJIAN CORPORATION
Construction Division—Dept. E
1200 N. Broad St.—Philadelphia 21, Pa.

DESIGN ENGINEERS

Positions available for men with experience in hydraulic and sanitary engineering. Water supply, sewerage and drainage projects.

Submit experience record, references, date available, age, and salary requirements.

ELSON T. KILLAM ASSOCIATES, INC.,
Hydraulic & Sanitary Engineers
48 ESSEX STREET, MILLBURN, NEW JERSEY

• POSITIONS VACANT

Estimator, attractive position. Experience should cover architectural & structural requirements for buildings. Knowledge of costs essential. Excellent salary. P-7958, Engineering News-Record.

Assistant Civil Engineer (Physical Research) Salary $7360 to $8910. Open to New York State residents. Requires B.C.E. and 2 years of civil engineering experience. For details write Recruitment Unit, Box 43C, New York State Department of Civil Service, The State Campus, Albany 1, N. Y.

Design Civil Engineer, experienced in design of piers, wharfs, docks, etc. State education, experience and all pertinent data. P-7961, Engineering News-Record.

• POSITIONS WANTED

General Supt., Proj. Mgr. Hvy. Const. roads, bldgs, bridges, flood control, tunnels, pipelines, sewage disp. Civil, Mech. PW-7787, Engineering News-Record.

Executive, 17 yrs const exp. efficient administrator mgr acct atty, employed. PW-7808, Engineering News-Record.

Layout Eng. or party chief-clerk of works, diversified expr., will travel, location immaterial—single. PO Box 949, Hollywood, Fla.

Executive Hydraulic Dredge Civil Engineer desires connection with dredge firm or dredge owner. Full time, project or consultation basis. Over 25 years experience dredge management, field investigation, cost estimates. No family, location immaterial. PW-7895, Engineering News-Record.

American Struct.-Mech. Engineer—now working in Italy. Age 41, single, 21 yrs. divers. liaison, field, design exp. Position desired in Europe. Zaffaroni, Via Nullo 24, Milano.

Construction Manager & Superintendent thoroughly experienced all types of and including heavy construction. Excellent & extensive background. Will send references for personal interview consideration. Overseas job acceptable. PW-7846, Engineering News-Record.

(Continued on opposite page)

• POSITIONS WANTED

(Continued from opposite page)

Project Manager Gen'l Supt., 43, 20 yrs. heavy construction, highways, dams, tunnels, mines, quarries, top producer proven record all phases presently employed $18 million volume, A-1 references, pilot 3500 hrs. PW-7841, Engineering News-Record.

Retired consultant, 55, Civil, Struct, seeks to invest $25M & services in establishing organization, N. Y. city area. PW-7957, Engineering News-Record.

Superintendent Excavation—Grading Highway—flood control. Estimating—experience. PW-7959, Engineering News-Record.

Executive Manager. Available immediately. Over thirty years experience all phases heavy and highway construction. PW-7954, Engineering News-Record.

Water Works Engineer, 25, married. Experienced in municipal distribution design and investigation. Desires position in same or similar field. PW-7960, Engineering News-Record.

Chief Mechanical Estimator—Administrator—Negotiations Govt Modifications—long & varied experience on missile bases, sewage plants & process piping. PW-7930, Engineering News-Record.

Economist—Feasibility studies for engineers. Experienced in all phases of economic forecasting, ports and harbors studies, traffic and commodity forecasts, land use requirements, urban development standards, textile plant location, financing. Ph.D. Domestic and foreign work. PW-7929, Engineering News-Record.

M.S.C.E., P.E., Reg. Struct. Eng., 38, European educ. 14 yrs. exp. Fluent French, German, Italian, desires position in Europe. PW-7928, Engineering News-Record.

Operations or Project Administrator—35 years, Office and Field Engineering—construction and operation, oil & gas industry—15 years, executive position in plant and pipeline phases of industry in Southwest and Canada. Now liquidating Engineering-Construction business. Resume on request. Registered Professional Engineer. Prefer Southwest area. PW-7935, Engineering News-Record.

Estimating involving quantity survey, obtaining prices and sub bids, assembling estimate for bidding and purchasing materials and awarding subcontracts. Fifteen (15) years experience on from small to jobs amounting to several million dollars. Thirty-seven (37) years old, can supply qualifying reference and other information required. Available for a position in January, 1962. PW-7936, Engineering News-Record.

Site Manager or Management Construction Engineer Superintendent, 37, BS, BSIE, MSIE, MAIR, 14 years experience as Staff Installations Engineer on U. S. & NATO Airfield construction, maintenance, and master planning. Responsible for engineering planning and design, maintenance and repair, utilities, preventive maintenance, power generation, fire protection and aircraft rescue, administration, liaison, supervision, organization and contract negotiations. Desire responsible position with established firm either stateside or abroad. Available January. Resume upon request. PW-7943, Engineering News-Record.

Highway Engineer—BSCE—age 32. 6 years highway construction experience in responsible position. Desire challenging job in construction or sales, domestic or foreign. Have pilot's license. PW-7955, Engineering News-Record.

Estimator PE Heavy Construction NYC Ten years office field experience. PW-7956, Engineering News-Record.

• SELLING OPPORTUNITY WANTED

Well Established Sales Engineering Firm in industrial construction field in Gulf Coast area are seeking additional lines in allied fields for sales representation for territory Northwest Florida to Louisiana state line. RA-7904, Engineering News-Record.

• WANTED

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Shallow draft 400 gross ton freighter for sale. All Caterpillar power in excellent condition. Ship located in South Florida. For further details contact
FS-7920, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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CRUSHING AND SCREENING PLANT
10" x 24" RB Jaw Crusher, 24" x 16" RB Roll Crusher, 30" x 8' 3½-Deck Screen, GMC diesel, pneumatic tires, excellent condition. New 1952.
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Telephone MU 2-0042 or MU 2-1898

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200 TON AMERICAN 200-160 GUY DERRICK. 160' BM. 180' MAST. 20' BULLWHL.
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30 TON WILEY TYPE F STIFFLEG DERRICK 60' BM.
20 TON AMERICAN STIFFLEG DERRICK 96' BM.
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40 TON AMER. #408 DIESEL LOCOMOTIVE CRANE.
1500 HP ALCO DIESEL ELEC. LOCOMOTIVES
70 & 45 TON GEN ELEC. DIESEL ELEC. LOCOS.
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2—Joy Twin Air Compressors, Model WN224-C, Capacity 6,300 c.f. each, complete with elec. panel boards, transformers & receivers—Like New. Located Hartford, Conn.
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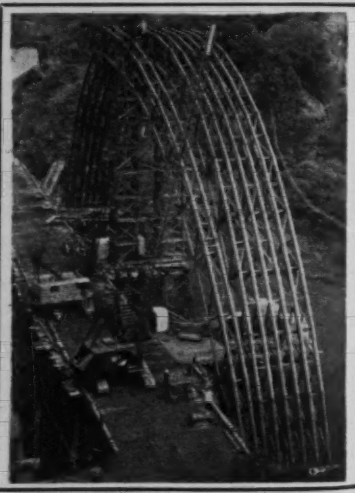

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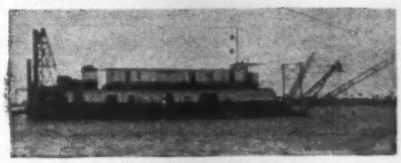

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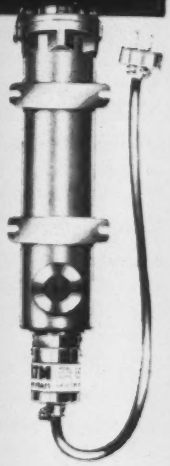

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Damaging Exaggerations

ONCE AGAIN it would seem that congressional investigators have leveled charges against a construction job, that, upon more careful study, prove to be unjustified. The case this time is the 140-mile highway in Cambodia financed by our International Cooperative Administration. The headlined charges were that nearly 70% of the road might have to be rebuilt because of poor design and skimped construction.

Now, after detailed on-the-site investigation, the engineer, Michael Baker, Jr., concludes that only 20% of the road is in trouble, and that gross overloading and lack of maintenance are the causes of the damage, rather than any faults in either design or construction. Moreover, most of the damage occurred in a section where a calculated risk was taken with a subbase of laterite, which the ICA had approved. Despite its involvement, however, the ICA offered no defense for the engineer during the hearings.

The case is reminiscent of the Moroccan airbase situation of some years ago in which Morrison-Knudsen was charged with poor construction that, upon investigation, was found to result from an Air Force-imposed speed-up of the work because of the Korean war.

There is perhaps little that can be done to change the character of congressional investigations, but it would help if government agencies would promptly come to the defense of their engineers and contractors when this is justified, as it so often is. Otherwise damaging exaggerations can occur.

Power Play Blunder

A REASONABLY GOOD CHANCE EXISTED, up to now, that Canada would resolve its internal disagreement over Columbia River power in such a way as to permit the proposed international development to go ahead. But U.S. Interior Secretary Stewart L. Udall has injected a new and disturbing note. It threatens the propects of Canadian ratification of the joint development treaty ratified by the U.S. early this year.

Mr. Udall has made public statements apparently favoring British Columbia Premier W. A. C. Bennett's campaign to reverse Ottawa's ban on export of power. Thus, in the Canadian view, the Secretary has thrust the U.S. government into Canada's domestic affairs.

It has been argued that the U.S. Northwest is approaching a point at which it must either have more Columbia power or give up the idea and commit itself to other sources. This has doubtful validity since the alternative sources—steam-electric plants fired with coal, oil or gas—are developed piecemeal rather than through wholesale regional commitments. But even if we faced a now-or-never decision on international development of the Columbia, barging into a family dispute in Canada is not a very promising way to win Canadian support.

Unless Mr. Udall is simply sounding off without thinking, he perhaps expects his tactics to pressure or embarrass the Canadian government into giving in to Premier Bennett. But an opposite effect is more likely. Already the Udall remarks have brought an angry rejoinder from Canada's Federal Justice Minister Davie Fulton, chief negotiator on the Columbia treaty.

The least harm Secretary Udall has done is to irritate some Canadian neutrals into opposing anything he favors. At worst he may have dealt a fatal blow to early U.S.-Canadian agreement on the Columbia.

When to Say Gee Whiz

THERE'S A WARNING all cubs in our publishing business get that goes something like this: Never write in a way that may sound naive. Be accurate, knowledgeable and interesting, but don't say Gee Whiz!

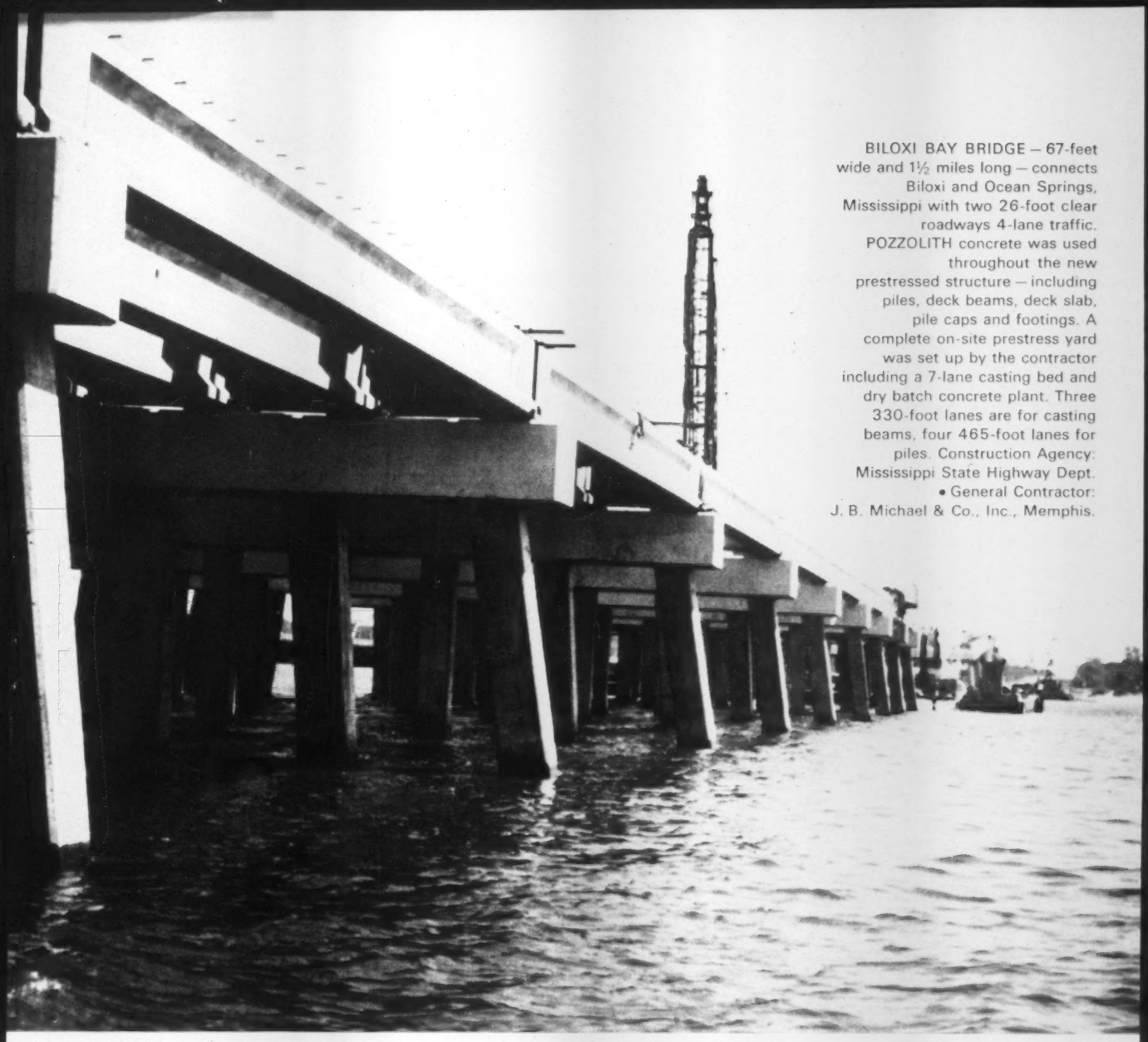
Sound as this advice may be, it must be tempered by a warning against becoming blase. For construction is an exciting business, and this excitement should be reflected. There are times for saying Gee Whiz. There are times the news rates a Wow!

For example: There is a $2.3-million bonus due Merritt-Chapman & Scott Corp. for early completion of Priest Rapids Dam. Not a windfall, this is an earned bonus, probably the largest ever paid. Also, when Priest Rapids was bid at $98 million it was the largest nondefense construction contract ever. But take a look at that $354-million bid just reported for Mangla Dam in the Indus River Basin. Wow! That's nearly 3½ times the dollar value of the Glen Canyon Dam contract, which took the U. S. record away from Priest Rapids for size of contract let under competitive bidding as distinct from negotiation.

If dollar signs no longer faze you, consider the technical marvels of the Chesapeake Bay-Bridge Tunnel. It will go 17½ miles across open water. And how about those competitive bridge and tunnel plans for crossing the English Channel? (ENR Nov. 30, p. 21)

Or take what they are doing to the old Metropolitan Life Insurance tower in New York City—changing everything on it but the clock. Gee! In another recent story there was a picture of a man busy at his desk while workers put up a temporary protection outside of which they are stripping and replacing the walls of still another occupied old office building.

There is so much opportunity for the superlative these days, so much real temptation to use the expletive. We will continue to try never to be naive in reporting construction, but please permit us—and yourselves—a Gee Whiz or a Wow now and then. Your industry's business and technical growth and achievements rate them. Construction is just downright exciting. And you, or we, wouldn't like it any other way.



BILOXI BAY BRIDGE – 67-feet wide and 1½ miles long – connects Biloxi and Ocean Springs, Mississippi with two 26-foot clear roadways 4-lane traffic. POZZOLITH concrete was used throughout the new prestressed structure – including piles, deck beams, deck slab, pile caps and footings. A complete on-site prestress yard was set up by the contractor including a 7-lane casting bed and dry batch concrete plant. Three 330-foot lanes are for casting beams, four 465-foot lanes for piles. Construction Agency: Mississippi State Highway Dept. • General Contractor: J. B. Michael & Co., Inc., Memphis.

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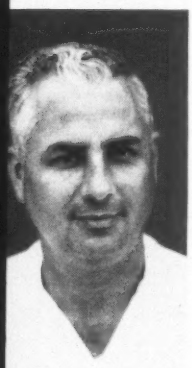

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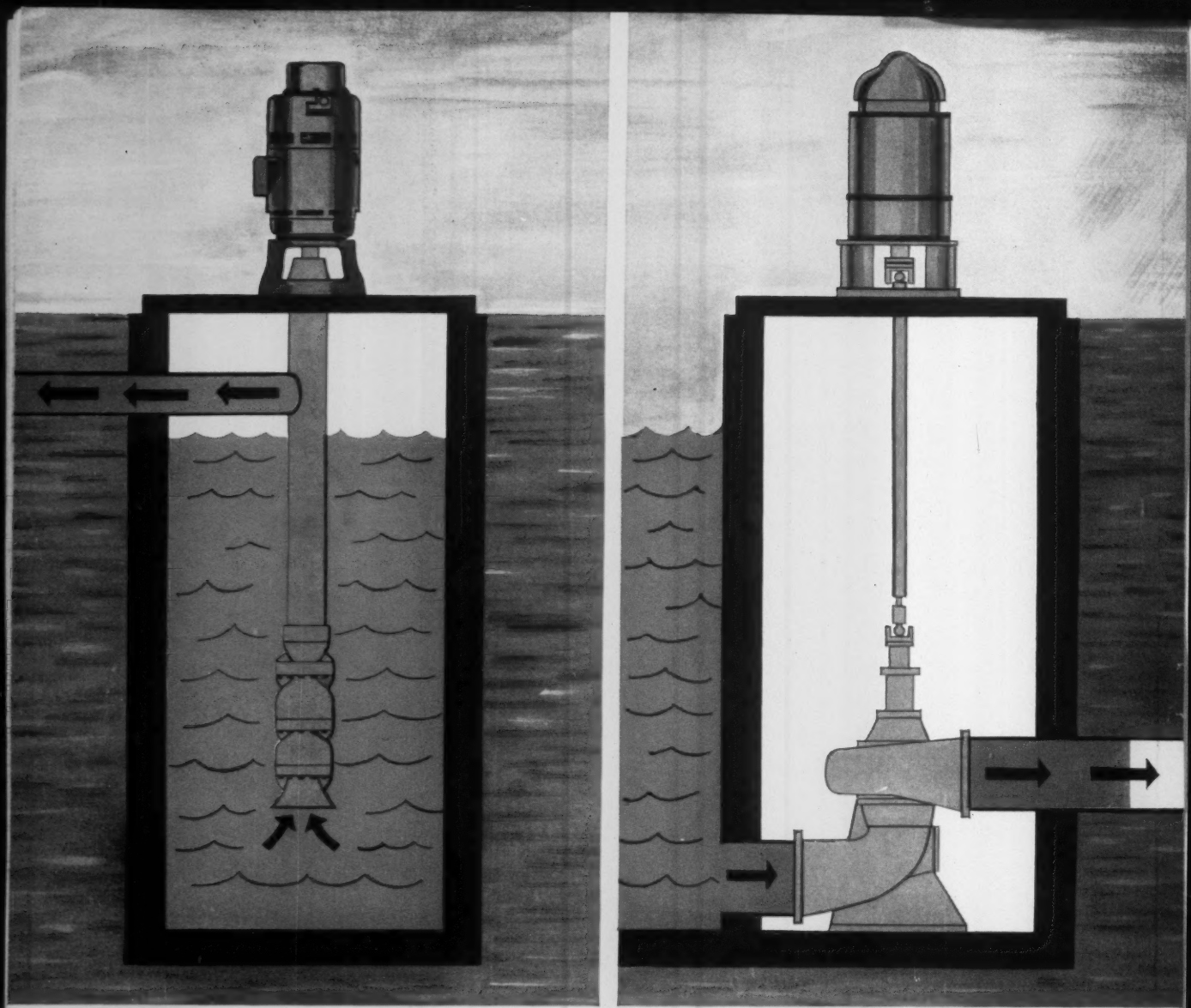

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For large capacity pumping for public works or in industry—which installation do you choose? Wet pit (submerged pump) or dry pit (pump surrounded by air)? Frankly, the choice is not clear-cut . . . they both work well.

How do you choose? You must weigh the tangibles (it's fairly easy) and weigh the intangibles (not so easy). At the left are some of the factors which must influence your final selection. Only careful and exhaustive study of all factors bearing on your installation will show you the right choice.

At Worthington we supply pumps for both types of installation so our technical representatives can give you unprejudiced advice. Contact your nearest Worthington District Office. Or write Worthington Corporation, Dept. 105-8, Harrison, N. J. In Canada, Worthington (Canada) Ltd., Brantford, Ontario.

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